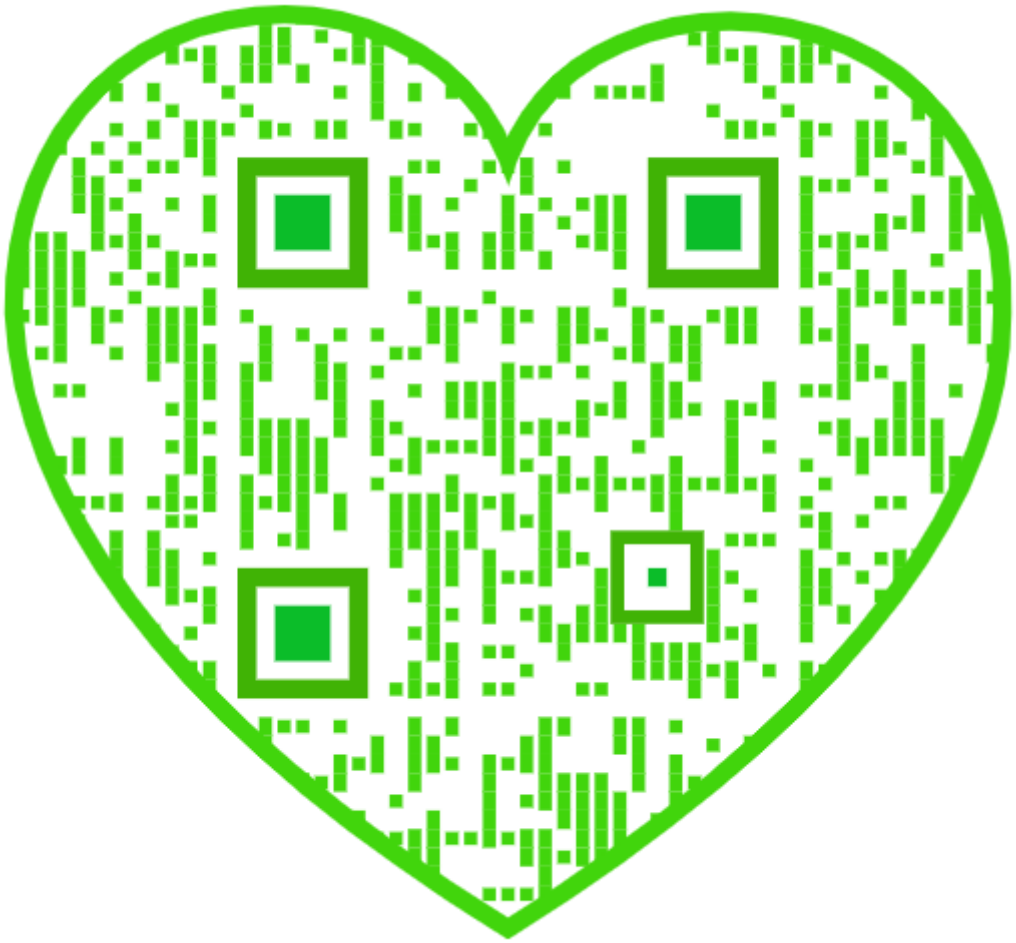

VETERINARY SCIENCE ASSOCIATION
OF AMERICA

VETERINARY MEDICINES

THEIR
ACTIONS, USES AND DOSE

BY

GEORGE F. KORINEK, V. S., B. V. S.

Graduate of the Ontario Veterinary College. Graduate from the Veterinary Department of the University of Toronto, Canada. Member of the Science Association of the Ontario Veterinary College. Registrar of the Veterinary Science Association of America. Ten years of Practical Experience in Veterinary Medicine and Surgery.

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PREFACE

There is no scarcity of excellent works on Veterinary materia medica and Therapeutics.

Many of these will well repay the student for the time spent in mastering them, but none seem to meet the wants of the Veterinary Practitioner and Student for whom this work is primarily intended.

It has been my endeavor to find, and bring together in available form, some of the facts regarded as of value to those upon whom the stockman must depend, to a great extent, for important services when sickness comes upon our dumb friends—the domestic animals.

A few publications have been consulted, and in some instances quoted. It has not been practicable to give proper credit for use of ideas and language in each instance, but a general acknowledgment is here made.

List of publications consulted and in some instances quoted:
United States Dispensatory (by Wood).
Veterinary Medicines (by Dun).
Veterinary Materia Medica and Therapeutics (by Winslow).
Veterinary Materia Medica, Therapeutics and Toxicology (by Quitman).

GEORGE F. KORINEK, V. S., B. V. S.

SUMMARY OF VETERINARY MATERIA MEDICA, THERAPEUTICS AND TOXICOLOGY

MATERIA MEDICA, derived from two *Latin* words signifying medical material, the science which treats with medicine, their source or origin, their derivatives, physical and chemical properties, their method of preparation and administration, their dose, physiological and toxicological effects.

THERAPEUTICS, derived from the Greek, *Therapevo,* meaning to serve or attend the sick, is that branch of knowledge which treats of the application of all means—medical or otherwise—to the cure of disease or relief of pain.

TOXICOLOGY, derived from the Greek *Toxikon,* a poison, is that branch of knowledge which treats of the nature, actions, detection and treatment of poisons.

A *medicine* is an agent of animal, vegetable, or mineral origin used for the cure of disease or relief of pain.

DRUG, derived from the Dutch, *Droog,* meaning dry, is now used synonymously with medicine although originally referring to an herb or dried medical plant.

GENERAL ACTIONS OF MEDICINES

ALTERATIVE.—A medicine that alters the process of nutrition, so as to overcome morbid conditions of the body as Arcenous Acid, Potassium Iodide, etc.

ANAESTHETIC.—Medicines used to produce insensibility to pain, and they are divided into Local and General Anaesthetics.

GENERAL ANAESTHETICS.—Are inhaled and carried by the blood to the brain and spinal cord, where they paralyze the nerve centers, cause muscular relaxation and finally produce entire suspension of sensation and power of motion, together with a loss of consciousness, and apparent life, except breathing and the action of the

heart. They comprise Nitrous Oxide Gas, Ether and Chloroform, etc.

Local Anaesthetics.—As a rule, are injected hypodermically or applied to open wounds. They cause temporary loss of local or circumscribed sensation by paralyzing the sensory nerves. When applied in the form of liniments they resemble anodynes, but act more promptly and profoundly. They comprise Cocaine, Eucaine, etc.

Analgesic.—A medicine used to relieve pain, as Opium, etc.

Anaphrodisiac.—A medicine used to produce absence or impairment of sexual appetite, as Potassium Bromide, etc.

Anhidrotic.—A medicine that diminishes the secretion of perspiration as Belladonna, etc.

Anodyne.—A medicine that lessens sensibility to pain, by diminishing the excitability of nerve centers, as Cannabis Indica, Chloral Hydrate, etc.

Anodynes Local.—Are drugs that diminish pain by acting locally on sensory nerves, and are applied in the form of a liniment over painful swellings, as Belladonna, Aconite, Opium, hot and cold packs, etc.

Antacid.—A medicine that counteracts or neutralizes acidity of the stomach or intestines as liquor Potassium, Sodium Carbonate and Bicarbonate, etc.

Antagonistic.—A medicine which counteracts the action of another medicine in the system, as would Potassium Bromide and Nux Vomica or Strychnine.

Anthelmintic.—A medicine efficiently destroying or expelling worms or preventing their development, as Santonin, Arecae Nut, etc.

Antidote.—A substance preventing or counteracting the action of a poison. Antidotes are distinguished as: chemical, those that change the chemical nature of the poison; mechanical, those that prevent absorption of poison; physiologic, those that counteract the effects of poison by producing other effects.

ANTIEMETIC.—A medicine which prevents or arrests vomiting, as Bismuth Subnitrate.

ANTIFEBRILE.—A medicine that reduces temperature, as Acetanilid, etc.

ANTIFEREMENT.—A medicine which prevents the formation of gases, as Sodium Bicarbonate, Turpentine, etc.

ANTIGALACTIC.—A medicine which lessens the secretion of milk, as Belladonna, Tannin, etc.

ANTIPARASITIC.—An agent which destroys and repels insects, as essential oils, powdered tobacco, sulphur and naphthalin, etc.

ANTIPERIODIC.—A medicine that tends to prevent the periodic recurrence of a disease, as Quinine Sulphate, Arsenous Acid, etc.

ANTIPERISTALTIC OR ANTIPERISTALSIS.—Are medicines that produce compression of peristalsis or the worm-like movement of the intestines by which method the alimentary canal propels its contents, as Opium.

ANTIPHLOGISTIC.—A medicine or agent subduing or reducing inflammation or fever, as in bloodletting, applications of cold packs or the administration of Aconite, Acetanilide, etc.

ANTIRHEUMATIC.—A medicine that prevents or cures rheumatism, as Sodium Salicylates, etc.

ANTIPYRETIC.—A medicine which reduces body temperature in fever, as Quinine Sulphate, Salicylic Acid, etc.

ANTISEPTIC.—A medicine which arrests putrefaction on or in the body, or hinders septic decomposition by killing the germs that produce it or by checking their development, as Carbolic Acid, Zinc Sulphocarbolates, etc.

ANTISPASMODIC.—A medicine which prevents or removes spasmodic contraction of voluntary or involuntary muscles, as Belladonna, Valerian, Chloral Hydrate, etc.

ANTITOXIN.—A counter poison or antidote generated within the body to counteract the toxins of bacteria. Antitoxins are frequently injected hypodermically in

the treatment of certain infectious diseases and also to immunize against disease, as Tetanus Antitoxin for the treatment of tetanus or lockjaw, etc.

ANTIVENENE.—A name applied to blood-serum of animals rendered immune against snake-poison owing to its antidotal properties.

ANTIZYMOTIC.—A medicine preventing fermentation, as Salicylic Acid, etc.

APERIENT.—A medicine possessing a mild laxative or purgative effect, as Rochelle Salts, etc.

APHRODISIAC.—A medicine which stimulates sexual appetite, as Cantharides, Nux Vomiva, Phosphorus, Alcohol and general tonics, etc.

AROMATIC.—A medicine characterized by a fragrant taste or odor, as Aromatic Spiritus of Ammonia, Ginger and the essential oils, etc.

ASTRINGENT.—A medicine which contracts vessels and arrests discharges, as Tannic Acid, Ergot, etc.

AUXILIARY.—A medicine that assists the action of another, as Chloral Hydrate would assist Bromide of Potassium in checking excitability.

BITTER.—A medicine with a bitter taste, stimulating the gastro-intestinal secretions without materially affecting the general system, as Qussia Gentian, etc.

BLENNORRHAGIC.—A medicine which increases the secretions of mucus, as Eucalyptus, Balsam Tulo, etc.

BLISTER.—An agent which, when applied over the skin, produces vesicles resulting from local inflammatory exudate of serous fluid between the epidermis and true skin, as applications of Cantharides, etc.

BOLUS.—A large pill or a round mass of food prepared by the mouth for swallowing.

BOUILLON.—A nutritive medium for the culture of micro-organisms prepared from finely chopped beef or beef extract.

CACHEXIA.—A deprived condition of general nutrition, due to serious diseases, as Tuberculosis, Scrofula, Syphilis, Cancer, etc.

CALEFACIENT.—A medicine applied externally to

produce a sensation of warmth to the part to which it is applied, as Turpentine, Mustard, Capsicum, etc.

CALMANT.—A medicine that reduces functional activity, as Bromide of Potassium, Aconite, etc.

CALMATIVE.—A medicine which has a quieting or a sedative effect, as Morphine, Cannibus Indica, etc.

CALORIFACIENT OR CALORIFIC.—A heat producing substance which has the power of developing heat in the body, as Cod Liver and Olive Oil, Fats, etc.

CARDIAC DEPRESSANT OR SEDATIVE.—A medicine which lessens the force and frequency of the heart's action as Aconite, Potassium Nitrate, etc.

CARDIAC STIMULANT.—A medicine that increases the force and frequency of the heart's action when in a depressed condition, as Alcohol, Nux Vonica, Ether, etc.

CARDIAC TONICS.—Are medicines that do not act as quickly as cardiac stimulants, but they strengthen the heart muscles which regulate pulsation, as Digitalis, Nux Vomica, etc.

CARMINATIVE.—A medicine that allays pain by causing the expulsion of gases from the alimentary canal, as Aromatic Spiritus of Ammonia, Asafetida, Turpentine, etc.

CATALEPTIC.—A medicine causing animals to lose control of their muscles, as Cannibus Indica, etc.

CATALYTIC.—A medicine supposed to break down, destroy or counteract morbid agencies existing in the blood, as Calomel, Arcenous Acid, etc.

CATHARTIC.—A medicine which hastens the evacuation of the bowels, as Aloes, Castor Oil, etc.

CATHARTIC CHOLAGOGUE.—A medicine that stimulates the evacuation of the intestines and the flow of bile at the same time, as Podophyllin, etc.

CATHARTIC DRASTIC.—A medicine which produces violent action of the intestines with griping and pain, as Jalap, Arecoline, etc.

CATHARTIC HYDRAGOGUE.—A medicine that causes abundant watery discharges of feces, as Commony Elaterium, etc.

CATHARTIC SALINE.—A medicine which increases intestinal secretions and prevents re-absorption, and mechanically excites peristaltic action, as Magnesium Sulphate, etc.

CATHARTIC SIMPLE.—A medicine that is more active then a laxative, but is accompanied by some griping; it causes active peristalsis and larger and softer stools than laxatives, as Rhubarb, Aloes, etc.

CAUSTIC.—A medicine or agent used to destroy living tissue, as Caustic Potash, Silver Nitrate, etc.

CAUTERY.—An agent used to sear or burn living tissue, with a cautery or a caustic, as a hot iron or Nitric Acid, etc.

CAUTERY ACTUAL.—A metal instrument heated by an electric current or by flame, used to destroy bone or muscular tissue or for producing counter-irritation, much preferred to seatons in diseases of the bones especially of their joints, as in Bone Spavin, Ringbone, etc., also valuable in the treatment of sprained tendons. The methods used are either puncture or line firing.

CAUTERY POTENTEAL.—A chemical used for destroying or cauterizing flesh, as Nitric Acid, etc.

CHALYBEATE.—A medicine containing iron, as Tincture Chlorid of Iron.

CONDIMENT.—A medicine used to improve palatability of food, as Fenugreek, Aniseed, Salt, Pepper, etc.

CONSERVATIVE.—A medicine or substance used for the preservation of other medicines without loss, as Alcohol, Honey, etc.

CONSTRINGENT.—A medicine which causes contraction of organic tissues, as Tannin, etc.

CONVULSANT.—A medicine which causes violent and unnatural contractions of muscles (convulsions) as Nux Vomica or its derivative, etc.

CORDIAL.—A medicine which increases the strength and raises the vitality when depressed, as Aromatic Spirits of Ammonia, Alcohol, etc.

CORRECTIVE or CORRECTANT.—A substance used to

modify or make pleasant the action of a cathartic or other medicines, as Acacia, Coriander, etc.

Corrosive.—A substance that destroys organic tissue either by direct chemical means or by causing inflammation and suppuration, as Mercuric Chloride, Nitric Acid, etc.

Counter Irritant.—A substance or medicine which produces superficial inflammation artificially in order to exercise a good effect, by stimulating functional activity of a part, thus promoting repair upon some adjacent or deep-seated morbid process, as Blistering or Firing, etc.

Cumulative Poison.—A medicine which finally acts as a poison after several successive doses have been taken with little or no apparent effect, as Arsenic, Strychnine, etc.

Debilitant.—A medicine which diminishes the energy of organs, as Bromide of Potassium, Lobelia, etc.

Defervescent.—A medicine that reduces temperature, as Quinine Sulphate, Aconite, etc.

Deliriant or Delirifacent.—A medicine which produces delirium, as Opium, Stramonium, Alcohol, etc.

Demulcent.—A mucilaginous or oily, soothing blend to protect irritated skin or mucous membranes, as Carron Oil, White of an Egg, etc.

Deobstruent.—A medicine which removes functional obstructions in the body, as Castor Oil, Magnesium Sulphate, Aloes, etc.

Deodorant or Deodorizer.—A substance to conceal or destroy foul odors, as Crude Carbolic Acid, Chloride of Lime, etc. Noxious odors may also be destroyed and absorbed with freshly burnt charcoal or dry earth.

Depletory.—A medicine which diminishes the quantity of liquid in the body, as Iodide or Nitrate of Potassium, etc.

Depressant.—A medicine which lessens vital power, as Opium, Aconite, etc.

DEPRESSO-MOTOR.—A medicine that depresses motor activity, as Sodium or Potassium Bromide, etc.

DEPURANT.—A medicine for cleaning foul wounds and abscesses, as Hydrogen Peroxide, etc.

DEPURATORY.—A medicine which purifies the blood, as Sulphur, Iodide Potassium, etc.

DERMATIC.—A medicine used in diseases of the skin, as Resorcinol, Zinc Oxide, etc.

DERIVATIVE.—A substance used in drawing away blood or liquid exudates from diseased parts by creating an extra demand for them in some other part of the body, as Mustard, Capsicum, Cantharides, etc.

DESICCANT.—A medicine used for drying up sores, as Tannic Acid, Boric Acid, etc.

DESICCATIVE.—A medicine which dries up secretions, as Zinc Oxide, Camphor, etc.

DESICCATORY.—A medicine used externally to dry up moisture or fluids from wounds, as Tannic Acid, Starch, etc.

DESQUAMATION.—A medicine which removes scales from the skin, bones and mucous membranes, as Potassium Iodide, etc.

DETERGENT.—A substance for purifying and cleansing wounds, ulcers, as Hydrogen Peroxide, Soap and Water, etc.

DIAPHORETIC.—A medicine which causes an increased amount of perspiration, as Pilocarpine, Ginger, etc.

DIARRHETIC.—A substance or medicine which causes increased frequency and lessened consistency of fecal evacuations, as Mandrake.

DIETETIC.—A medicine having nutritious properties, as Olive or Cod Liver Oil, etc.

DIGESTANT.—A medicine that assists digestion of food, in the mouth, stomach or intestines, as Pancratin, Pepsin, etc.

DIGESTIVE.—A medicine which promotes the process of digestion, as Gentian, Qussia, Nux, Vomica, etc.

DILUENT.—A medicine that dilutes the secretions of organs, as Magnesium Sulphate, Gamboge, Arecoline, etc.

DISCUTIENT.—A substance or medicine having the power of causing an exudation to disappear, as Iodide of Potassium, Red Iodide of Mercury, etc.

DISINFECTANT.—A medicine which destroys septic poisons of communicable diseases; its special function is to kill or hinder the development of those germs or bacteria which produce diseases, as Carbolic Acid, Chloride of Lime, Formaldehyde, etc.

DISSOLVENT.—A medicine that promotes solution of tissues of the body, as Potassium Iodide, etc.

DIURETIC.—A medicine that increases the secretions of the urinary organs, as Potassium Nitrate, Buchu, Turpentine, Spirits Ether Nit, etc.

DRASTIC.—A medicine having a severe purgative or cathartic effect on the bowels, as Croton Oil, etc.

EBOLIC.—A medicine causing contraction of the uterus, and thus producing abortion, as Ergot, etc.

ELECTUARY.—A substance used to lessen irritability or increase the palatability of medicines, as Sugar, Honey, Molasses, Water, etc.

ELIMINATIVE.—A medicine having power of expelling or casting out, especally waste products, as Arecoline, Magnesium Sulphate, etc.

EMETIC.—A substance or medicine having the power to induce vomiting, as Apomorphine, Ipecac, etc.

EMMENAGOGUE.—A medicine which stimulates menstrual flow, as Potassium Permanganate, etc.

EMOLLIENT.—A substance used externally to soften, sooth and relax parts to which they are applied as vegetable poultices, oils, etc.

EPISPOSTIC.—A medicine producing a blister, as Cantharides, Aqua Ammonia Fort, etc.

ERRHINE.—A medicine that increases nasal secretions, as Formalin, Capsicum, etc.

EVACUANT.—A medicine which causes the emptying

of an organ, especially the bowels, as Magnesium Sulphate, Aloes, etc.

Excitant.—A medicine that arouses functional activity, as Nux Vomica, Alcohol, etc.

Exhilarant.—A medicine which cheers or stimulates the mind, as Strychinine, Alcohol, etc.

Expectorant.—A medicine that acts upon the pulmonary mucous membranes to increase or alter its secretions, as Lobelia, Chloride of Ammonia, etc.

Febrifuge.—A medicine which lessens bodily temperature, as Quinine, Acetanilid, Aconite, etc.

Fumigation.—Is a process of disinfection by exposure to the fumes of a vaporizing disinfectant, as Formaldehyde.

Galactagogue.—A medicine or substance which stimulates the secretions of the mammary glands, thereby increasing the flow of milk, as Segenaroot, Pilocarpine, etc.

Germicide.—A medicine which destroys germs of any kind whether bacilli, spirilli or micrococci, as Bichloride Mercury, Carbolic Acid, etc.

Hematinic.—A medicine that increases the proportion of hematin or coloring matter in the blood, as Iron, Arsenic, etc.

Hemolytic.—A medicine which causes the breaking down of the blood corpuscles, as Mineral Acids.

Hemostatic.—A medicine which stops bleeding, as Tincture Chloride of Iron, Ergot, etc.

Hepatic Depressant or Sedative.—A medicine that decreases the function of the liver, as Plumbi Acetate, Morphine, etc.

Hepatic Stimulant.—A medicine which increases the functions of the liver, as Calomel, Podophyllin, etc.

Hidrotic or Hydrotic.—A medicine that stimulates perspiration (sweat), as Pilocarpine, Spirits Ether Nit., etc.

Hydragogue.—A medicine which causes full watery evacuations from the bowels, as Arecoline, Gamboge, etc.

HYPNOTIC.—A medicine which produces sleep, as Chloral Hydrate, Morphine, Potassium Bromide, etc.

HYPOSTHENIC.—A medicine which causes weakness, debility, as Lobelia.

IDIOSYNCRASY.—A peculiarity of constitution that makes one person or animal react differently to medicines or other influences from most persons or animals.

INSECTICIDE.—A substance used to destroy insects, as unrefined carbolic acid, benzine, etc.

INTOXICANT.—A drug which excites or stupifies, as alcohol, etc.

IRRITANT.—A medicine or agent causing heat, pain and tension due to the increased flow of blood to the part, as heat, mustard, etc.

LACTAGOGUE.—A medicine which increases the flow of milk, as extract of malt, jaborandi, etc.

LAXATIVE.—A medicine that loosens the bowels; a mild cathartic or purgative, as potassium nitrate, sulphur, etc.

LENITIVE.—A substance having the quality to relieve pain or protecting tissues from the actions of irritants, as fats, oils, etc.

LIQUEFACIENT.—A medicine which promotes the liquefying processes of the system, as potassium iodide, etc.

LITHAGOGUE.—A medicine which expels calculi (or stones) from the kidneys or bladder, as benzoic acid, etc.

LITHOLYTIC or LITHONTRIPTIC.—A medicine to dissolve calculi (or stones) as benzoate of ammonia, carbonate of potassium, etc.

LUBRICANT.—A substance which soothes irritated surfaces of the throat and their fauces, as honey, olive oil, etc.

MEDICAMENT.—Any medicine used in the treatment of diseases or wounds.

MEDICINE.—Any substance for the cure of disease.

MYDRIATIC.—An agent which dilates or enlarges the pupil of the eye, whether used internally or externally, as atrophine.

Myotic.—Any agent that contracts the pupil of the eye, whether applied to the eye or taken by the mouth, as eserine, arecoline, etc.

Narcotic.—A medicine which produces sleep and relieves pain, but first cause cerebral excitement, as chloroform, ether, belladonna and alcohol, etc.

Nephritic.—A medicine used in diseases of the kidneys, as buchu, uva ursi, etc.

Nervine.—A medicine that calms nervous excitement or acts favorably in nervous diseases, as potassium bromide, chloral hydrate, etc.

Nutrient.—A medicine which builds up the waste tissues of the system, as cod liver oil, general tonics, etc.

Obtundent.—Any agent which relieves irritation or reduces sensibility, as opium, poultices, etc.

Odontalgic.—Any substance for the relief of toothache, as oil of cloves, morphine, etc.

Odorant.—Any substance with a pronounced odor, as naphthaline, asafoetida, etc.

Opiate.—A drug which causes sleep, as chloral hydrate, opium, etc.

Oxytocic.—Any agent that produces parturition, as cotton root, ergot, etc.

Panacea.—A medicine curing all diseases; a cure all, as some patent medicines.

Parasiticide.—A substance that destroys various animal and vegetable organisms or parasites which live upon the surface of the body, as mercurial and sulphur ointment, etc.

Parturient or Parturifacient.—Any agent assisting in the birth of the young, as ergot.

Peristaltic.—A medicine which increases the movements of the longitudinal and transverse muscular fibers of the intestines and assists them in expelling their contents as nux vomica, arecoline, etc.

Placebo.—Any medicine or inert substance given for the purpose of satisfying the patient, rather than for its medical effects, as sugar, fenugreek, anise, etc.

Poison.—An agent that when introduced into the

body either destroys life or impairs seriously the functions of one or more of its organs, as potassium cyanide, hydrocyanic acid, etc.

Potential.—A medicine which possesses restorative effects, but is delayed in its effects, as potassium iodide, arsenic, etc.

Preservative.—A substance which prevents decomposition of another substance, as acetanilid, borac acid, etc.

Preventive or Prophylactic.—A medicine or method that tends to prevent disease, as quinine for the prevention of malaria, vaccine, hygienics, etc.

Protective.—A substance used for protecting the parts to which it is applied, as collodion, etc.

Pungent.—Any substance producing a sharp, pinching, penetrating effect, as ammonia.

Purgative.—A medicine causing copious evacuations of the bowels. (See Cathartics.)

Pustulant.—A medicine which irritates and gives rise to the formation of pustules, as cantharides, croton oil, etc.

Recuperative—A medicine which restores health and energy, as extract of malt, cod liver oil, etc.

Refrigerant.—A medicine or agent having cooling properties or the power of lowering internal or external temperature, as potassium nitrate, aconite, cold water, etc.

Relaxant.—A substance which causes relaxation of muscular tissues, as chloroform, chloral, etc.

Reparative.—A substance used to restore debilitated tissues of the body, as general tonics, nitrogenous foods, etc.

Resolvent.—A substance indicated in the treatment or absorption of hard, callous tissue, as iodine and its preparations.

Restorative.—A medicine that aids in restoring the health, as nux vomica, arsenic, etc.

Revulsant or Revulsive.—An agent which pro-

duces irritation and draws fluids from other parts diseased, as poultices, cantharides, etc.

Rubefacient.—A medicine or agent causing irritation and redness of the skin, as turpentine, mustard, etc.

Sedative.—A medicine which diminishes functional activity, as potassium or ammonium bromide, etc.

Septic.—An agent causing poisoning resulting from the absorption of products of putrefaction, as bacteria.

Sialogogue.—A medicine stimulating the flow of saliva, as pilocarpine, arecoline, ginger, capsicum, etc.

Somnifacient or Soporific.—A medicine which produces drowsiness and sleep, as morphine, chloral hydrate, potassium, bromide, etc.

Sorbefacient.—A medicine used to produce abortion, as ergot.

Specific.—A medicine or agent which has a distinct curative influence on an individual disease, as potassium iodide, in actinomycosis (Lumpy Jaw) or oxygen in milk fever, etc.

Stimulant.—A medicine which quickens or increases functional activity, as strychnine, ammonium carbonate, alcohol, etc.

Stomachic.—A medicine which increases functional activity of the stomach, as quassia gentian, etc.

Stomatic.—A medicine used in diseases of the mouth, as boric acid, potassium chlorate, alum, etc.

Superfacient.—A medicine causing unconsciousness from which the patient can be roused, as opium, bromide of potassium, etc.

Styptic.—An agent that checks bleeding by causing contraction of the blood vessels, as tincture chloride of iron, ergot, etc.

Succedaneum.—A medicine which may be substituted for another possessing similar properties, as chloral hydrate for potassium bromide, or aloes for linseed oil, etc.

Sudorific.—A medicine or agent which produces an increased quantity of perspiration (sweat) as ginger pilocarpine, Dover's powders, etc.

SUPPURANT.—A medicine or agent promoting pus formation, as poultices, cantharides, croton oil, etc.

SYNERGIST.—A medicine which co-operates or assists the action of another, as chloroform with ether, cantharides with red iodide of mercury, etc.

TAENICIDE.—A medicine which destroys tape worms, as extract of male fern.

TAENIFUGE.—A medicine which expels tape worms, as areca nut, pumpkin seed, oil of turpentine, etc.

TETANIC.—A medicine or agent which increases the irritation of the spinal cord or muscles producing spasms, as strychnine, etc.

TONIC.—A medicine promoting nutrition and giving strength to the body, as arsenic, cod liver oil, etc.

TOPIC or TOPICAL.—A substance or agent for external use, applied locally, as a liniment.

TOXIC.—A condition produced by a poison, as a result of an over-dose of medicine or the absorption of bacterial products.

TRICOPHYED.—A medicine promoting the growth of hair, as pilocarpine, cantharides, capsicum, etc.

UTERINE.—A medicine acting upon the uterus, as ergot.

VEHICLE.—A medicine or agent used as a medium or base for the administration of medicines, as syrups, oils, water, etc.

VERMICIDE.—A medicine which destroys parasitic worms, as turpentine, iron sulphate, tobacco, creosote, etc.

VERMIFUGE.—A medicine which expels parasitic worms, as arecoline, aloes, etc.

VESICANT.—A medicine which forms justules containing white serum, as cantharides.

VIRUS.—A poison of an infectious disease, especially one found in the system of an animal suffering from an infectious disease, as hog cholera, cowpox or rabies virus, etc.

VULNERARY.—Any medicine or compound used in the treatment of wounds, as ointments, liniments, etc.

ADMINISTRATION OF MEDICINES

The following methods of administering medicines in order of their rapidity of absorption, beginning with the method by which absorption is most rapid, and following with those by which absorption is less rapid and finally least rapid: 1. Intravenous, by injection into veins. 2. By inhalation (volatile drugs). 3. Subcutaneous, by injection into subcutaneous tissue. 4. Intratracheal, by injection into the trachea (or wind pipe). 5. Oral, by the mouth. 6. Rectal, by the rectum. 7. Inunction, by the skin. 8. Intramammary injections.

WHEN MEDICINES SHOULD BE ADMINISTERED

The curative effects of medicines may be restrained, changed in form or prevented by untimely administration.

Medicines intended to act on the mucous membrane of the stomach should only be given when that organ is empty. If distant parts are to be affected in the most prompt and efficient manner and the medicine is free from distinct irritating qualities, it should be taken on an empty stomach; as when digestion is going on, the contents of the stomach are acid in reaction and if alkalies are given combinations take place and salts are formed. If alkalies are given before digestion begins, diffusion of the acid-forming constituents of the blood takes place, and in this way the acidity of the gastric juice is promoted; likewise acids given before meals increase the diffusion of the alkaline constituents of the blood.

METHODS OF ADMINISTERING MEDICINES

Drenching, bit, balling gun, capsule gun, bottle, dose syringe and hypodermic syringe.

Anaesthetics administered in feed bags or proper inhaler.

TABLES USED IN PRESCRIPTION WRITING

APOTHECARIES OR TROY WEIGHT.

20 Grains (Granum).....(Gr. or Grs.)=1 Scruple.
3 Scruples (Scrupulum).....(Sc.)=1 Drachm (60 Grs.)
8 Drachms (Drachma).....(ʒ)=1 Ounce.
12 Ounces (Uncia).....(℥)=1 Pound (℔)

In prescription writing the pound sign should not be used; always express large quantities by ounces.

APOTHECARIES' LIQUID MEASURE.

60 Minims (Minimum).....(M. or Ms.)=1 Fluid Drachm.
8 Fluid Drachms (Fluid Drachma).(fl. ʒ)=1 Fluid Ounce.
16 Fluid Ounces (Fluid Uncia)....(fl. ℥)=1 Pint.
2 Pints (Octarius).....(O.)=1 Quart.
4 Quarts or 8 Pints=1 Gallon.....(congius—C.)

In prescribing liquids the abbreviation for Quarts (Qts.) is never used. If a quart is desired it is expressed as two pints (Oij).

APPROPRIATE EQUIVALENTS OF WINE UNITS IN DOMESTIC MEASURES.

Teaspoon	=ʒi.
Dessert spoon	=ʒii.
Table spoon	=ℨss.
Cup	=℥iv.
Tumbler	=℥viii.

TABLES FOR REGULATING THE DOSES FOR YOUNG ANIMALS

HORSES.

3 years old and upward, full dose.
From 1½ years old to 3 years, ½ dose.
From 9 to 18 months old, ¼ dose.
From 4½ to 9 months old, ⅛ dose.
From 1 to 4½ months old, $\frac{1}{16}$ dose.

CATTLE.

2 years old and upward, full dose.
From 1 to 2 years old, ½ dose.
From ½ to 1 year, ¼ dose.
From 3 to 6 months, ⅛ dose.
From 1 to 3 months, $\frac{1}{16}$ dose.

SHEEP.

2 years old and upward, full dose.
From 1 to 2 years old, ½ dose.
From ½ to 1 year, ¼ dose.
From 3 to 6 months, ⅛ dose.
From 1 to 3 months, $\frac{1}{16}$ dose.

PIGS.

1½ years and upward, full dose.
From 9 to 18 months old, ½ dose.
From 4½ to 9 months, ¼ dose.
From 2½ to 4¼ months, ⅛ dose.
From 1 to 2½ months, $\frac{1}{16}$ dose.

DOGS.

From ½ to 1 year old, full dose.
From 3 to 6 months, ½ dose.
From 1½ to 3 months, ¼ dose.
From 20 to 45 days, ⅛ dose.
From 10 to 20 days, $\frac{1}{16}$ dose.

THE ART OF PRESCRIBING

The prescription should be as brief and simple as possible. It should be explicit and clearly written. It may be expressed either in Latin or in English. The manner in which the medicine is to be used should be specified. Important instructions as to the rule, systematic regulations or diet of the patient are sometimes necessary.

Prescriptions usually contain two or more of the following four representative constituents: (1) The *basis* or active ingredients. The practice of conjoining several active medicines has wisely been abandoned. Occasionally, however, it may be advantageous to give together two medicines producing their effects in somewhat different ways. Thus, spasms of the bowels are more often effectually controlled by the conjunction of a stimulant like ether and an anodyne like opium than by either given alone. Pain which is not alleviated by either morphine or atropine is sometimes abated by giving them together. (2) The *adjuvant* is introduced in order to increase, moderate or modify the action of the basis. Frequently its chief object is to insure solubility and ready absorption. (3) A *corrective* is occasionally required to temper the effects of the basis. Thus a small dose of opium is prescribed with oil or other laxative in cases of diarrhoea; ginger is generally added to

the aloetic mass to prevent its griping. (4) The *vehicle* generally consists of some comparatively inert substance, added to facilitate administration, such as the treacle, linseed meal or licorice powder used as an excipient for boluses and pills, the benzoated lard or vaseline used for making ointments, and the water given in drenches.

Example:

℞
Barb. Aloes.....ʒi.
Calomel .....ʒi.
Ginger .....ʒii.
Molasses .....ʒss.
M. et fiat massa, in bolus 1.
Sig. Give at once.

—John Jones.

In the above prescription aloes is the basis; calomel as an adjuvant, ginger as a corrective, molasses as an excipient.

A prescription is composed of several parts, which may be considered as follows:

1. Heading.
2. Names and quantities of drugs.
3. Directions to compounder.
4. Directions to attendant.
5. Signature of writer.

1. For Gray Tom. July 22, 1916.
℞
2. Cupri sulph.,
Ferri. sulph. exsic., aa. ʒiss.
Pulv. belladonna fol.,
Pulv. gentian rad. aa. ʒiii.
3. M. Ft. Chart No. XII.
4. Sig.—One powder three or four times daily in syrup.

—John Jones.

ABBREVIATIONS

PRESCRIPTION WRITING.

Words, phrases and abbreviations commonly used in prescription writing.

R—means take thou.
M.—Misce, mix.
Fiat—make.
Ad.—add, to make.
Et.—means and.
Sig.—Signa, label, or write thus.
Numerus—number.
O.—Oclarius, a pint.
Ter.—thrice.
C. or Cong.—Congius, gallon.
Dies.—diem, day.
Q. S.—Quantum sufficiat. Sufficient quantity.
Bene—well.
q. s. ad.—quantity sufficient to make certain amount.
Q. h.—quaqua—hora, every hour.
aa.—ana. Of each.
S.—Semis, means half.
S. S.—Semi or Semissis means one-half.
Cum.—with.
Stat.—statim, immediately.
B. I. D.—Bis in die. Twice daily.
T. I. D., or T. D.—three times daily, Ter in die.
Q. D.—quarter in die; four times daily.
P. Æ.—Partes æquales, equal parts.
Div.—divide.
Gtt.—Guttæ, drops.
Grs.—Grains.
ʒ—Drachma, dram.
ʒ—Uncia, ounce.
M.—Minims about a drop.
℈—Scruple.
M. ft.—mistura fiat; let a mixture be made.
Pil.—Pilula; pill.
Destil.—Destilla; distill.
Liq.—liquor a solution.
Pulv.—Pulvis; powder.
Fl.—fluidus, fluid.
Bol.—Bolus, large pill.
Cola—strain.
Filtra—filter.
Capsula—cap. A capsule.
Charta—chart. A paper (medicated).
Dosis—Dos.. A dose.
Massa—Mass. A pill—mass.
Unguntum—Ungt. An ointment.
Syrups—Syr. A syrup.
Vinum.—Vin. A wine.
Aqua fontana—Aq. font.—Spring water.
Aqua. destillata—Aq. dest.—Distilled water.

ACIDUM BORICUM—BORACIC ACID—BORIC ACID

Derivation.—Made by evaporation and crystallization of a solution obtained by passing steam issuing from rocks in volcanic regions of Italy, through water; or by the action of hydrochloric or sulphuric acids upon borax. Recovered by filteration and recrystallization.

Properties.—Transparent colorless scales, of a somewhat pearly luster, six-sided tricline crystals, or a light white, very fine powder, slightly unctuous to the touch; odorless, having a faintly bitterish taste, and permanent in air. Soluble in water, alcohol, glycerine, etc.

Dose.—Horses and cattle, 2 to 4 drs.; foals and calves, 20 to 30 grs.; sheep and pigs, 30 to 40 grs.; dogs, 5 to 20 grs.

PREPARATIONS

GLYCERITUM BOROGLYCERINI — GLYCERITE OF BOROGLYCERIN

Composed of boric acid, 310 parts; glycerin to make 1,000; prepared by heat (303° F.).

Actions.—Boric acid is a non-volatile, non-irritating antiseptic, deodorant and astringent, it arrests fermentation of minute organisms, free of irritating effects in solution, when applied to wounds; it lessens suppuration, and is as effective as carbolic acid; can be used in any strength from the pure powder or saturated solution to the mildest form.

Uses.—Boric acid is indicated for all purposes for which an antiseptic is used; it is used in diarrhoea in foals, calves and dogs, combined with other drugs; it has a slightly astringent action of itself; it is excreted in the urine, consequently would exert its influence on the bladder in crystitis, cystic catarrh; 1 part in 800 prevents the development of anthrax-bacilli; useful in skin diseases, also used in keratitis and catarrhal and purulent conjunctivitis, six to ten grains to the ounce, with atropine or cocaine when very painful. Useful in dis-

temper of dogs where the bowels are affected, as an antiseptic. Boric acid is preferred to carbolic acid as an antiseptic for dogs. On account of the paralyzing effect of carbolic acid on the nerves, it hinders the healing of wounds to a certain extent, while the boracic acid does not.

Boric acid may be applied pure to wounds and sores or mixed with other suitable drugs as a dusting powder. Equal parts of boric acid and zinc oxide make a cheap and effective healing powder; to an itching wound the addition of an equal quantity of acetanilide increases its value. A saturated solution (four per cent) is useful as a vaginal and uterine douch and to flush the bladder in cystitis.

ACIDUM CARBOLICUM CRUDUM—CRUDE CARBOLIC ACID

Derivation.—A liquid consisting of several different constituents of coal tar, particularly cresol and phenol, obtained by fractional distillation.

Properties.—A nearly colorless, or reddish-brown liquid of a strong disagreeable and creosote-like odor, and gradually turning darker on exposure to the air and light. Soluble in fifteen parts of water.

PHENO—ACIDUM CARBOLICUM—CARBOLIC ACID

Derivation.—Obtained from crude carbolic acid by agitation with caustic soda, heating to 338° F., and adding hydrochloric acid. Then by agitation with sodium chloride, digestion with calcium chloride, and distillation at a temperature between 336° F. and 374° F. and finally by crystallization.

Properties.—Phenol in its pure state is a solid at ordinary temperatures, crystallizing in minute plates or long rhomboidal needles, white or colorless, of a peculiar odor recalling that of creosote, and an acrid burning taste. It is likely to be colored pinkish or brown under the influence of light and air. Soluble in about

19.6 parts of water, and very soluble in alcohol, ether, chloroform, glycerin, fixed and volatile oils.

Actions.—Phenol in large and undiluted doses is an irritant and narcotic poison; it is used as an antiseptic, parasiticide, antiferment and sometimes used as a local anaesthetic or anodyne in a 2 to 5 per cent solution; also as a caustic, but should not be used as a caustic as a burn from it heals very slowly.

Uses.—Internally as a gastric sedative in small doses for vomiting in dogs; is administered in various contagious and infectious diseases with the view of preventing or arresting the development of micro-organisms; it coagulates albumen, is not nearly so active as bichloride of mercury; 1 part to 500 parts of water prevents the growth of anthrax and other bacilli. Full doses produce gastro-enteritis, and collapse, which may end fatally; it is a muscular and nerve paralyzer, both internally and externally, it kills by paralyzing the muscles of respiration and the heart. It is chiefly eliminated from the system by the kidneys, giving the urine a brownish color.

In Surgery.—A three to five per cent solution is used for washing out wounds, a two to three per cent for hands, and for itching of the skin, carbolic acid three or four drachms, glycerine two ounces to one pint of water. Do not use over large surface on dogs and not at all on cats.

Phenol treatment for Tetanus, which has given very good results and I would recommend one drachm in three ounces of water, injected hypodermically in the region of neck and shoulder every two or three hours until twelve injections were given and less frequently thereafter.

Doses.—Of the phenol: Horses and cattle, 10 to 40 grs.; sheep and pigs, 5 to 10 grs.; dogs, ½ to 1 gr., well diluted.

Toxicology.—Dogs and cats are especially susceptible to the action of carbolic acid, therefore great care

must be exercised when washing, especially cats, with any preparation containing carbolic acid. Disinfecting and deodorizing cat's quarters with any preparation containing carbolic acid makes them sick.

ANTIDOTE.—Sulphates of soda or magnesia. Atropine sulphate hyodermically is a very valuable antidote. Alcohol and vinegar have been used with good results, both internally and externally.

ACIDUM SALICYLICUM—SALICYLIC ACID

An organic acid, existing naturally in combination in various plants, but largely prepared synthetically from carbolic acid.

DERIVATION.—Made by passing carbonic dioxide through sodium carbolate at a temperature of 428° F. (220° C.). $2\,NaC_6H_5O$ (sodium carbolate) $+ CO_2 = Na_2C_7H_4O_3$ (sodium salicylate) $+ C_6H_6O$ (phenol). Sodium salicylate is treated with hydrochloric acid when salicylic acid is precipitated.

PROPERTIES.—Light, fine, white, needle-shaped crystals, odorless, having a sweetish, afterwards acrid taste; permanent in air. Soluble in alcohol, ether and hot water; borax increases its solubility.

DOSE.—Horses, 2 to 6 drs.; cattle, ½ to 1 oz.; sheep, 1 to 2 drs.; pigs, 30 to 40 grs.; dogs, 5 to 20 grs.; should be given well diluted; large doses are recommended for fevers, but smaller doses more often repeated in rheumatism.

SODII SALICYLAS—SODIUM SALICYLAS

DERIVATION.—Made by the action of salicylic acid on sodium carbonate. The solution is filtered and heated to expel carbon dioxide.

PROPERTIES.—A white amorphous or crystalline powder or scales; odorless and having a sweetish, saline taste. Permanent in air. Soluble in water, alcohol and glycerine.

DOSE.—Same as for salicylic acid.

PHENYLIS SALICYLAS—PHENYL SALICYLATE (Salol)

Derivation.—Made by heating salicylic and carbolic acids with phosporous pentachloride.

Properties.—A white crystalline powder; odorless, or having a faintly aromatic odor, and almost tasteless. Permanent in air. Insoluble in water, soluble in ten parts of alcohol and readily soluble in chloroform.

Dose.—Same as for salicylic acid.

Actions.—Salicylic acid, sodium salicylate and phenyl salicylate are powerful antiseptic, anti-rheumatic, diaphoretic, cadiac depressant, antiferment and antipyretic. Salicylic acid is in addition irritant and astringent, continued in large doses is apt to derange digestion; best to be administered on a full stomach.

Uses.—For acute rheumatism, influenza, strangles and purpura where there is much sloughing; also as a surgical wash, salicylic acid one part, borax one part to thirty or forty parts of water. Salicylic acid is a more powerful antiseptic than carbolic acid. Salicylic of soda is freely antiseptic. Salicylic acid is highly recommended in intestinal flatulence, given in two drachm doses with one ounce of aromatic spirits of ammonia. In gastric-flatulence give two drachms in capsule, repeat in half hour if necessary.

ACONITUM—ACONITE—MONKSHOOD

Derivation.—Aconite is obtained from the root of aconitum napellus, which grows in Northwestern North America, Europe and Asia in mountainous regions, and cultivated in the United States for its beautiful flowers.

Properties.—The fresh leaves have a faint narcotic odor, most sensible when they are rubbed. Their taste is at first bitterish and herbaceous, afterwards burning and acrid, with a feeling of numbness and tingling on the inside of the lips, tongue and fauces, which is very durable, lasting sometimes many hours. When long chewed they inflame the tongue. The dried leaves have

a similar taste, but the acrid impression commences later. Their sensible properties and medical activity are impaired by long keeping. They should be of a green color, and free from mustiness. The root has a feeble earthy odor. Though sweetish at first, it has afterwards the same effect as the leaves upon the mouth and fauces. It shrinks much in drying and becomes darker, but does not lose its acrimony. Those parcels, whether of leaves or roots, should always be rejected which are destitute of this property. Aconite root is officially described as being "slenderly conical, 4 to 10 cm. long, 10 to 20 mm. thick at the crown; occasionally split; longitudinally wrinkled; dark brown and marked with coarse whitish root-scars; fracture short, horney or mealy; internally whitish or light brown; the cambium zone irregular and 5 to 7-angled; odor very slight; taste sweetish, soon becoming acrid and developing a tingling sensation, followed by numbness."

Preparations of the leaves are not official in the U. S. P. The root is five times stronger than the leaves.

Constituents.—The alkaloid representing the action of the drug is aconitine, which is precipitated by ammonia from an aqueous solution of an alcoholic extract of the root of various species. It is a colorless, crystalline or amorphous, gray powder, almost insoluble in water, and soluble in 22 parts of alcohol, in 44 parts of ether and 1 part of chloroform. Its salts are soluble in water. Aconitine or its solutions, unless very dilute, are too poisonous to be tasted.

Commercial preparations vary in purity and strength, and since it is extremely poisonous its internal administration is undesirable. Pseudo-aconitine, aconitine and other alkaloids in combination with aconitic acid have been obtained from aconite, but their identity and chemistry are uncertain.

Dose.—Horses and cattle, 3 to 20 grs.; sheep and pigs, 1 to 3 grs.; dogs, 1/10 to 1/11 gr.

PREPARATIONS

FLUIDEXTRACTUM ACONITI — FLUID-EXTRACT OF ACONITE

Made by maceration and percolation with alcohol and water and evaporation. Assayed so that each 100 c. c. contains 0.4 gm. aconitine.

Dose.—Horses and cattle, 5 to 20 m.; sheep and pigs. 2 to 5 m.; dogs, 1/10 to 1 m.

TINCTURA ACONITI—TINCTURE ACONITE

Made by maceration and percolation of aconite, 100; with alcohol and water to make 1000.

Dose.—Horses and cattle, 20 m. to 1 dr.; sheep and pigs, 10 to 20 m.; dogs, 2 to 10 m.

Fleming's Tincture (non-official) (79 per cent).

Dose.—Horses and cattle, 8 to 20 m.; dogs, ½ to 2 m.

ACONITINA—ACONITINE

Not used to any extent in veterinary practice; is very unreliable and varying in strength. Aconitine often contains a considerable proportion of aconite and benzaconine, and so varies in activity, which is a great objection to the use of one of the most powerful drugs known.

Dose.—Horses and cattle, 1/30 to 1/5 gr.; dogs, 1/200 to 1/100 gr. subcutaneously.

Actions of aconite, its preparations and derivative are anodynes and sedatives, acting specially on the preipheral endings of the sensory nerves, on the heart and on respiration. Aconite kills by respiratory arrest.

Its physiological actions as a cardiac and respiratory sedative renders it a febrifuge; it is also diaphoretic and diuretic. It is prescribed in acute febrile conditions, and in the earlier stages of acute local inflammation. It is used topically to relieve pain.

General Actions.—Locally applied, in virtue of its action on sensory nerves, aconite produces first irritation, tingling and twitching and subsequently numbness and anesthesia. The tincture of aconite is rapidly

absorbed and quickly passed into the tissues, as is shown by the blood of a poisoned dog five minutes after the drug has been administered, being transferred into the veins of another dog without producing the physiological action of the poison.

Toxic Effects.—One and one-half drachm of the tincture (equal to about one drachm of aconite root) is given as the minimum fatal dose for the horse, one-half drachm will occasionally cause very serious symptoms and where an idiosyncrasy exists as little as fifteen minims will cause toxic symptoms.

It causes great muscular weakness, dimness of sight; pupil at first may be dilated or contracted, but as the end approaches remains dilated; shallow irregular and labored respiration, a slow and small pulse, becoming rapid and imperceptible near the end. Gulping, frothy saliva, flatulence, belching, retching, nausea, etc. There is often a peculiar clicking sound made from the constant attempts at swallowing.

Coldness of surface, clammy sweat, anxious countenance, extreme weakness of the extremities, lowering of temperature 2 to 3 degrees, abolishment of sensation, reflexes and motility and finally death from paralysis of the heart and respiration, with or without convulsions, consciousness being preserved until near the end, when carbon dioxide narcosis sets in.

Uses.—It antagonizes the fever process, when properly used is a most valuable drug; it is indicated in all affections, characterized by high resisting pulse, dry, hot skin and elevated body temperature; is useful in acute throat affections as laryngitis, pharyngitis and perotiditis, in small doses often repeated. Indicated in acute inflammation of the organs of resperation. For pleurisy and perotidities, at the outset, give aconite with opium. Aconite is indicated in simple fevers or in puerperal fever, inflammation of the brain; in acute or inflammatory rheumatism, in acute local inflammation, as arthritis or inflammation resulting from bruises, sprains, etc.

In lymphangitis, laminitis and enteritis, if called in first stages of enteritis give 20 ms. of aconite and repeat with 10 or 15 ms. every hour and between times gives fluid extract of belladonna 15 to 20 ms. every hour and externally woolen blankets wrung out of hot water and wrapped around the body.

In mammitis is also useful in large doses, combined with phytolacca; in spasmodic colic brought on by drinking cold water, give 30 to 60 ms. of the tincture of aconite with other colic mixture; in congestion of the bowels or liver, or in congestion of any part, small repeated doses are better than large ones. It is also advantageously used in lung disorders.

AETHER—ETHER—PURE ETHER

A liquid composed of about 96 per cent, by weight, of absolute ether or ethyl oxide, and about 4 per cent of alcohol containing a little water.

Derivation.—Prepared by distillation of alcohol with sulphuric acid. There are two steps in the production of ether; sulphorvinic acid and water are formed in the first step. Sulphorvinic acid is then further acted upon by alcohol. The distillate is freed from water by agitation with calcium oxide and chloride and subjected to redistillation.

Properties.—A transparent, colorless, mobile liquid, having a characteristic odor and a burning and sweetish taste. Ether is highly volatile and inflammable; its vapor, when mixed with air and ignited, explodes violently. Miscible in all proportions with alcohol, chloroform, benzine, benzol, fixed and volatile oils. Ether is a solvent for fats, oils, alkaloids, resins, gutta percha and guncotton. Upon evaporation ether should have no residue. Ether vapor is heavier than air and consequently etherization should never be done above a light or fire.

Dose.—Horses and cattle, 1 to 2 ozs.; sheep and pigs, 2 to 4 drs.; dogs, 10 ms. to 1 dr.

As an anaesthetic, horses and cattle require from 4 to 16 ozs. Smaller animals from 4 drs. to 4 ozs. Chloro-

form is usually prescribed for large animals and ether for smaller animals. Ether never paralyzes a healthy heart, while chloroform sometimes does. For anaesthetic purposes see anesthesia.

PREPARATIONS

SPIRITUS AETHERIS—SPIRIT OF ETHER

Composed of ether, 325 parts, alcohol to make 1000.

Dose.—Same as ether.

SPIRITUS AETHERIS COMPOSITUS—COMPOUND SPIRIT OF ETHER—HOFFMAN'S ANODYNE

Composed of ether, 325 parts; alcohol, 650 parts; ethereal oil, 25 parts.

Dose.—Same as for ether.

Actions.—Ether is anodyne, antispasmodic, diaphoretic, anthelmintic; a cardiac, respiratory and cerebral stimulant, an anesthetic and a narcotic poison; one of the best and quickest acting, diffusible, general stimulants, acting on the heart reflexly from the stomach. It is a powerful secretory stimulant, acting especially on the secretions of the stomach, salivary glands and pancreas. On the cerebrum and the motor and sensory nerves, its actions are similar to that of alcohol, but more prompt and less protracted; it is eliminated quickly, chiefly by the lungs.

When inhaled, it first causes irritation of the fauces, a sense of strangulation and cough, then a stage of excitement in which the visible mucous membranes are flushed and the respiration and pulse quickened; a convulsive stage generally follows, with rigid muscles and respiration stertorous; this subsides and complete insensibility is established, the muscles being relaxed and the reflexes abolished; in fact all of the functions of the body are suspended, except respiration and circulation.

If the inhalation be continued these too become paralyzed, death usually resulting from slow paralysis of respiration (chloroform paralyzes quickly); the heart pulsating long after breathing has ceased. Atropine

hypodermically is the best antagonist to the toxic effects of ether, also artificial respiration and injections of brandy.

Uses of Ether.—When mixed with alcohol, as the spirit, ether mixes readily with water. It is excellent in indigestion with flatulence; it checks gastric fermentation, expels the gas and overcomes irregular and violent gastro-intestinal movements; hence, is also very good in spasmodic colic. In spasmodic colic, best to combine with cannabis indica or belladonna. When used as a vermifuge it should be followed by a purge. Used diluted one to ten to dislodge worms in the rectum. A most reliable remedy for collapse. Ether and alcohol are indicated in parturient paresis, ether with aqua ammonia may be used intravenously when the cow is unable to swallow. Sulphuric ether and alcohol or whisky are also good in parturient eclampsia of bitches, though aromatic spirit of ammonia is better; for chills, spirit of nitrous ether; also useful in convalescence from debilitating disease. Ether is a very good remedy in Thumps. Ether may be used for local anesthesia, applied as a spray, from an atomizer, about one ounce, usually being enough for the painless opening of abscesses or fistulae, but cocaine is better in our patients. *As an anesthetic* it should be used in preference to chloroform, for the smaller and young animals, especially dogs, which are easily killed by chloroform. Ether is less prompt in action but much safer than chloroform, as it never paralyzes a healthy heart; it should be inhaled in as concentrated a form as possible, very little air being allowed, so it will exert its effects quickly, in the dog; a light or fire of any kind should not be allowed near, as ether is very inflammable and its vapor explosive. Always have a bottle of aqua ammonia fort. at hand as a restorer.

ALCOHOL

Alcohol is derived directly from fruit sugar, and indirectly from starch. The grains, as wheat, rye, corn; and potatoes, supply starch most economically. The

starch in these substances is converted into glucose by heating with very dilute sulphuric acid, or by fermentation with malt. Glucose is further acted upon by yeast containing the Torula cerevisiae, which converts 15 per cent of glucose into alcohol and carbonic dioxide. The weak alcohol resulting is subjected to repeated distillation until sufficiently pure and concentrated. In the natural fermentation of fruit sugar in grape juice, during the formation of wine, the amount of alcohol is self-limited to 15, rarely 20 per cent, since the ferment is killed by a larger amount of alcohol than this.

Derivation.—The official alcohol is derived from rectified spirits, by maceration, first with anhydrous potassium carbonate, then freshly fused calcium chloride, and finally by distillation.

Properties.—A liquid composed of about 92.3 per cent, by weight, or 94.9 per cent, by volume, of ethyl alcohol (C_2H_5OH) and about 7.7 per cent, by weight, of water (U. S. P.). A transparent, colorless, mobile and volatile liquid, of a characteristic rather agreeable odor and a burning taste. Specific gravity about .816 at 15.6 C. (60° F.). Miscible with water in all proportions and without any trace of cloudiness. Also miscible with ether chloroform. It is readily volatile at low temperature, and boils at 78° C. (172.4° F.). It is inflammable and burns with a blue flame.

Dose.—Horses and cattle, 1 to 3 oz.; sheep and pigs, 2 to 4 dr.; dogs, 1 to 2 dr. Diluted four to six times its bulk of water.

PREPARATIONS

ALCOHOL ABSOLUTUM—ABSOLUTE ALCOHOL

Ethyl alcohol, containing not more than one per cent, by weight, of water.

Derivation.—Percolation of the purest alcohol through quicklime, out of contact with the air, and redistillation in vacuo.

Properties.—Transparent, colorless, mobile and volatile liquid, of a characteristic rather agreeable odor

and a burning taste. Very hydroscopic. Specific gravity not higher than 0.797 at 15.6° C. (60° F.).

SPIRITUS FRUMENTI—WHISKY

Derivation.—An alcoholic liquid obtained by the distillation of the mash of fermented grain (usually of mixtures of corn, wheat and rye) and at least four years old.

Properties.—An amber-colored liquid having a distinctive odor and taste, and a slightly acid reaction. Its specific gravity should not be more than 0.945, nor less than 0.924, corresponding, approximately, to an alcoholic strength of 37 to 47.5 per cent, by weight, or 44 to 55 per cent, by volume. Contains no more than traces of fusel oil. The alcholic liquors owe their flavor to bouquet to ethers which are only developed in course of time. The amylic alcohol, or fusel oil, in whisky is therefore converted into ethers, which give the characteristic flavor to whisky.

Dose.—Horses and cattle, 2 to 4 oz.; sheep and swine, 1 to 2 oz.; dogs, 1 to 4 dr., diluted three to four times its bulk in water.

SPIRITS VINI GALLICI—BRANDY

Derivation.—An alcoholic liquid obtained by the distillation of the fermented unmodified juice of fresh grapes, and at least four years old.

Properties.—A pale amber-colored liquid, having a distinctive odor and taste and a slightly acid reaction. Its specific gravity should not be more than 0.941, nor less than 0.925 at 15.6° C. (60° F.), corresponding, approximately, to an alcoholic strength of 39 to 47 per cent, by weight, or 46 to 55 per cent, by volume, of absolute alcohol.

Dose.—Same as that for whisky.

SPIRITUS JUNIPERI COMPOSITUS—COMPOUND SPIRIT OF JUNIPER

Derivation.—Oil of juniper, 8; oil of caraway, 1; oil of fennel, 1; alcohol, 1,400; water to make 2,000.

Compound spirit of juniper is similar to gin in its therapeutic action. Contains about 15 per cent more alcohol. Gin is made by distillation of fermented malt and juniper berries. Gin differs from the other alcoholic preparations therapeutically in being more diuretic.

Dose.—Same as that for whisky.

RUM (not official)

Rum is made from a fermented solution of molasses by distillation. It contains, by weight, from 40 to 50 per cent of absolute alcohol. Rum does not differ physiologically from alcohol. There is no authoritative Latin name for rum.

Dose.—Same as that for whisky.

VINUM ALBUM—WHITE WINE

Derivation.—An alcoholic liquid made by fermenting the juice of fresh grapes, the fruit of Vitis vinifera, free from seeds, stems and skins.

Properties.—A pale amber or straw-colored liquid, having a pleasant odor, free from yeastiness and a fruity, agreeable, slightly spirituous taste, without excessive sweetness or acidity. The Pharmacopoeia (1890) directs that the wine should contain from 7 to 12 per cent, by weight, of absolute alcohol. California Hock and Reisling, Ohio Catawba, Sherry, Muscatel, Madeira or the stronger wines of the Rhine, Mediterranean and Hungary come within the pharmacopoeial limits. Wines containing more than 14 per cent of alcohol are usually fortified, i. e., have alcohol or brandy added to them, and much imported Sherry and Madeira contain 15 to 20 per cent, by weight, of absolute alcohol.

Dose.—Same as that for whisky.

VINUM RUBRUM—RED WINE

Derivation.—An alcoholic liquid made by fermenting the juice of fresh colored grapes, the fruit of Vitis vinifera, in presence of their skins.

PROPERTIES.—A deep red liquid, having a pleasant odor, free from yeastiness, and a fruity moderately astringent, pleasant and slightly acidulous taste, without excessive sweetness or acidity. Should contain not less than 7 nor more than 12 per cent, by weight, of alcohol. Native Claret, Burgundy, Bordeaux and Hungarian wines may be included within the pharmacopoeial limits of vinum rubrum. Port (vinum portense) is fortified with brandy during fermentation, and contains 15 to 25 per cent, by weight, of absolute alcohol. Port is astringent from tannic acid in the grapes, skin and stalks, or the astringency may be due to logwood. Red wines are said to be rough, contain tannic acid and therefore are astringents. Dry wines are those which contain little sugar. The wines develop ethers with age and these improve their flavor and action.

Champagne contains about 10 per cent of absolute alcohol and carbonic acid gas, which acts as a local sedative upon the stomach. Ale, stout and beers contain from 4 to 8 per cent of alcohol, together with bitters and malt extracts.

Cider contains 5 to 9 per cent of absolute alcohol. Imported sherry (B. P.) contains 15 to 20 per cent of absolute alcohol.

Alcohol is the solvent most commonly employed in pharmacy, dissolving alkaloids, resins, volatile oils, balsams, oleo-resins, tannin, sugar, some fats and fixed oils.

DOSE.—Horses and cattle, 3 to 6 oz.; sheep and pigs, 1 to 3 oz.; dogs, 2 dr. to 1 oz.

ACTIONS.—Alcohol is a cerebral excitant and finally becomes a depressant and a narcotic poison.

It is anesthetic, antiseptic, antiparasitic, rubefacient (if confined), mild astringent, coagulate albumen; a local refrigerant by virtue of its rapid evaporation, unless confined by bandage, oiled silk, etc., when it is absorbed by the tissues and causes a sensation of warmth.

In medical doses it is a powerful general stimulant; it is very diffusible, and is partly oxidized by the organism, and partly excreted; thus alcohol acts as a food.

Small doses relax the blood vessels, stimulate the gastric glands, promote appetite and digestion; lessen the elimination of waste products, by preventing rapid tissue waste; causes a feeling of warmth, and temporarily, though slightly, raises the body temperature. It stimulates the heart and increases the functional activity of all organs, especially the kidneys and skin.

Large or too long continued doses derange the appetite and digestion, congest or inflame the stomach and liver. Eight ounces of alcohol killed a horse. Alcohol is poisonous and should be used with caution.

Uses.—Are numerous, used principally as a stimulant, either in one large dose, 2 to 3 ounces of alcohol, or better, in small repeated doses, 1 ounce every 1, 2 or 3 hours, can be conjoined with other stimulants such as sulphuric ether, aromatic spirits of ammonia, digitalis, etc.

It is used in anesthetic mixtures, such as alcohol, ether and chloroform, combined in different proportions; in snake bites it is administered in very large doses.

In blood poisoning alcohol is a most potent drug, sustaining the heart, lowering the temperature and acting as a germicide. Alcohol makes an excellent dressing for wounds; applied locally to threatened bed-sores, frequently prevents their formation. It is useful in colds at their outset, or in a chill to restore the balance of the circulation and prevent or overcome internal congestion by relaxing the blood vessels of the periphery.

All alcoholic liquors are useful in debilitating diseases, such as influenza, in two or three ounce doses repeated every three or four hours. One-half to one drachm of quinine to one ounce of alcohol, for influenza or febrile diseases in general, excepting brain and spinal disease; useful in convalescence. In colic alcohol can be used with a great degree of success; it will act as a carminative antispasmodic and stimulant, used in collapse and weak heart; in septiceamia and pyaemia it has notable antiseptic and antipyretic effects. Useful in

carbolic acid poisoning, alcohol, or alcoholic liquors, act as a chemical antidote besides overcoming the shock produced by the acid. It may also be used locally for carbolic acid burns.

The effects of alcohol are noticed in ten or fifteen minutes after administration and will be shown by a better condition of the pulse, the weak pulse becoming stronger and firmer; the quick pulse slower, the breathing becomes more natural, eyes brighten up and in fact a general improvement is shown.

Externally alcohol is used alone as a strengthening application to weak tendons and muscles; or after a race, is used to rub on the legs, combined with other drugs as a liniment, as alcohol, soap-liniment and witch hazel; can be used in surgery as an antiseptic.

To toughen the skin of tender or thin skinned horses who gall or chafe easily under the collar and saddle, alcohol will be found a most satisfactory application.

ALOE BARBADENSIS—BARBADOES ALOES

The thickened juice of the leaves of Aloe vera, Linn., Aloe chinenisis, Bak., and probably other species, evaporated to dryness.

Habitat.—The Barbadoes Island.

Properties.—In hard masses, orange, brown, opaque, translucent on the edges; fracture waxy or resinous; odor saffron-like; taste strongly bitter. Almost entirely soluble in alcohol; most used in veterinary medicine.

Constituent.—Aloin; a resin; volatile oil; gallic acid.

Dose.—Horses, ½ to 1 oz.; cattle, 1 to 2 oz.; sheep, ½ to 1 oz.; pigs, 2 to 4 dr.; 20 gr. to 1 dr.

ALOE SOCOTRINA—SOCOTRINE ALOES

The juice that flows from the transversely cut leaves of Aloe Perryi, Baker, evaporated to dryness.

Habitit—Eastern Africa.

Properties.—In hard masses, occasionally soft in the interior; opaque, yellowish-brown, orange-brown or

dark ruby-red, fracture resinous. When moistened it emits a fragrant saffron-like odor; taste peculiar, strongly bitter. Almost entirely soluble in alcohol and four parts of boiling water. The powdered socotrine aloes is brighter and redder, and the odor less disagreeable than that of Barbadoes Aloes.

CONSTITUENTS.—About the same as Barbadoes Aloes.

DOSE.—Same as Barbadoes Aloes.

ALOINUM—ALOIN

A neutral principle obtained from several varieties of aloes, chiefly from Barbadoes and Socotrine Aloes.

DERIVATION.—Obtained by pulverizing and macerating aloes in cold water, and evaporating the resulting solution in vacuo. Aloin crystallizes out and is dried between folds of bibulous paper. It is purified by repeated solution in hot water, filtration, recrystallization, and finally by solution in hot alcohol and crystallization.

PROPERTIES.—A micro-crystalline powder or minute acicular crystals, lemon yellow or dark yellow in color, possessing a slight odor of aloes and intensely bitter taste. Soluble in water and alcohol.

DOSE.—Horses and cattle, 2 to 3 dr.; sheep, 20 to 60 gr.; pigs, 10 to 40 gr.; dogs, 11 to 20 gr.; combined with other purgatives.

PREPARATIONS

TINCTURA ALOES ET MYRRHAE—TINCTURE OF ALOES AND MYRRH

Made by maceration and percolation of purified aloes, 100 parts; myrrh, 100 parts, and liquoric root, with alcohol and water to make 1000.

DOSE.—Dogs, ½ to 1 dr.

ACTION.—Aloes is a purgative, acting chiefly on the large intestines; small doses are bitter tonics; it stimulates both peristalsis and secretion, increases secretion of bile; is also diuretic; applied externally it is stimulant and desiccant; the Barbadoes is the most active and uniform in its effects.

Aloes should be kept in lumps in tin cans or other good containers, only powdered for immediate use; in melting aloes don't let the temperature rise above 120 degrees as it impairs the activity by converting the active aloin into inert resin. Aloes operate in from 12 to 24 hours after administration; don't repeat an aloetic purge until 24 hours have elapsed. It also does not cause catharsis. In about 15 hours, the patient should be exercised, but returned to the stall as soon as the desired effect is evident. If it fails to act in 24 hours, linseed oil may be given. Aloin appears to contain the active principles of aloes, and is usually as operative, but some manufactures are ineffective.

Uses Internal.—In dyspepsia with capricious appetite, irregularity of the bowels, hide-bound horses, worms; is used in colic, both spasmodic and flatulent, for overloaded condition of the bowels; to promote excretion of waste products from the bowels and the blood, and consequently relieve febrile symptoms; rheumatic attacks, skin irritation, swollen limbs and inflamed joints; in lymphangitis to prevent and aid in curing. By attracting the blood to the bowels, it is useful in congestion or inflammation of the brain and spinal cord, full doses being necessary; in paralysis, paraplegia or hemiplegia or reflexed paralysis due to indigestion, give full doses. Aloes should not be used in irritation or inflammation of the alimentary canal or piles. It is not advisable to give an aloetic purge when the temperature is above 102° F. Nor in hemorrhage from the rectum; in high fevers it is apt to cause superpurgation, also should not be used where there is great debility or weakness. In influenza the bowels are apt to be irritable and oil is preferable to aloes. Don't use during pregnancy; may cause abortion. For young foals or other animals, the gentler purgative, such as linseed or castor oil should be used. The medical value of aloes being large, it is impossible to enumerate all the diseases in which it is useful. Externally the tincture of aloes and myrrh is sometimes applied as a stimulant to wounds, and pow-

dered aloes is mixed with plaster of paris in making splints for dogs to prevent these animals from biting and tearing them off. Internally aloes should be combined with ginger, nux vomica and given in capsule or bolus.

ALUMEN—ALUM

Derivation.—From alum slate, shale, schist, a native mixture of aluminum silicate and iron sulphide. This is roasted and exposed to the air, when the sulphur is oxidized into sulphuric acid and combined in part with aluminum and iron to form sulphates. The mass is lixiviated with water, and aluminum and iron sulphates together with sulphuric acid are recovered in solution. The solution is concentrated and to it is added potassium chloride. The double sulphate of potassium and aluminum (alum) is formed, which crystallizes out on cooling, while potassium sulphate and ferric chloride remain as by-products. Alum is purified by recrystallization.

Properties.—Large, colorless, octahedral crystals, sometimes modified by cubes or crystalline fragments; without odor, but having a sweetish and strongly astringent taste. On exposure to the air the crystals are liable to absorb ammonia and acquire a whitish coating. Soluble in nine parts of water, insoluble in alcohol.

Dose.—Horses and cattle, 2 to 4 dr.; sheep and pigs, 20 gr. to 1 dr.; emetic for dogs, ½ to 1 dr.

ALUMEN EXSICCATUM—DRIED ALUM

Commonly termed burnt alum, is alum deprived of its water of crystallization by heat.

Properties.—A white granular powder, odorless, having a sweetish astringent taste, soluble in twenty parts of water at 60° F. Is a powerful astringent and escharotic.

ALUMINI HYDROXIDUM—ALUMINUM HYDROXIDE

Derivation.—Made from alum, 100 parts; monhydrate sodium carbonate, 43 parts; water, a sufficient

quantity. Mix hot, boiling solutions of alum and sodium carbonate. Precipitate strained, washed and dried.

PROPERTIES.—A white, light, amorphus powder; odorless and tasteless; permanent in dry air; insoluble in water or alcohol.

DOSE.—Same as alum.

ALUMINI SULPHAS—ALUMINUM SULPHATE

DERIVATION.—Aluminum hydroxide is dissolved in diluted sulphuric acid, and the solution is filtered and evaporated to dryness.

PROPERTIES.—A white, crystalline powder, without odor, having a sweetish and afterwards astringent taste; permanent in the air; soluble in one part of water; insoluble in alcohol.

DOSE.—Same as alum.

ACTIONS.—Astringent, at first excites flow of saliva, then markedly decreases it; coagulates pepsin, thus it would derange or entirely arrest digestion; it also stops peristalsis and produces constipation, though sometimes it induces diarrhoea by irritation. It arrests secretions in general and in the circulation contracts the capillaries; it is in this way it arrests secretions, especially those of mucous surfaces, and stops capillary hemorrhage. The sulphate of aluminum is mildly caustic, astringent and antiseptic. Dried alum is caustic and astringent.

EXTERNALLY.—Dried alum is a caustic, in contact with raw sores, on account of its affinity for water. Alum has no action on unbroken skin, but applied to mucous membranes or denuded parts it is antiseptic and astringent; coagulates albumin of discharges; precipitates or coagulates albumin of the tissues; squeeze blood out of the vessels; reduces inflammation and makes the part whiter, brings together and denser. Alum is a hemostatic, stopping bleeding by compression of the structures surrounding the vessels and by causing blood to clot.

USES.—In diarrhoea and dysentery, but other astrin-

gents are safer and better, as it may lock the bowels too tight, may be used in weeping sores or weeping skin diseases; in long standing nail wounds by putting one-half to one pound into the soaking tub, also in same way for injured coronets, with raw bulging surfaces that bleed easily, also for sore mouth, sometimes mix a little boric acid; useful in bleeding piles, and in mild solution alum one ounce to water one pint for sore throat; also used internally for bloody urine (haematuria) and for open joints apply the powdered alum to arrest the flow of joint oil (synovia). For catarrhal ophthalmia, after the acute stage, an alum lotion five grains to one ounce of water is very serviceable; for granular lids rub with a crystal of alum. Alum should never be used too strong over the eye as it seems to have the power of dissolving the cornea; a solution containing ten grains of alum to the ounce of water may be used in canker of the ear of dogs; also for leucorrhoea and prolapsus of the rectum; dried alum may be used as a caustic whenever a caustic is indicated, but is not recommended for this purpose. For a powerful drying powder, especially useful when excessive granulation exists. It causes sloughing of the dead tissues and is indicated when the use of the knife is inadmissible.

AMYLIS NITRIS—AMYL NITRITE

A liquid containing about 80 per cent of amyl nitrite, together with variable quantities of undetermined compounds.

Derivation. — Obtained through distillation of nitric and amylic alcohol. Distillate purified by sodium carbonate.

Properties.—A clear, yellow or pale yellow liquid, oily, very volatile, peculiar and very diffusive ethereal odor and a pungent aromatic taste. Insoluble in water, but soluble in all proportions in alcohol, ether and chloroform.

Dose.—Horses and cattle, ½ to 1 dr.; sheep and pigs, 5 to 15 ms.; dogs, 2 to 5 ms.; amyl nitrite is very seldom given internally; hypodermically, one-half this

dose. By inhalation, same as given internally. It should be fresh as it rapidly deteriorates.

ACTIONS.—It stimulates the heart's action, greatly dilates the arterioles by paralyzing their muscular coats; causes a sense of fullness in the brain with vertigo, fall of blood pressure due to dilation of the arterioles, lowering of temperature; when the vapor is applied direct to muscular or nerve tissues it suspends or completely arrests its functional activity; it depresses the nervous system and unstriped muscular fiber. Overdoses cause death by respiratory failure.

USES.—Epileptic attacks may be warded off by its being inhaled; spasmodic asthma, used either internally, hypodermically or best by inhalation; in strychnine poisoning, angina pectoris in tetanus, and as a heart stimulant. It is useful as an inhalation in bringing about recovery from deep chloroform and anesthesia.

ANISUM—ANISE

ORIGIN.—The anise plant is a native of Egypt and the Levant, but has been introduced in various parts of that continent. It is also cultivated occasionally in the gardens of this country. The fruit is abundantly produced in Malta and Spain; in Romagna, in Italy, whence it is largely exported through Leghorn, and in Central and Southern Russia.

DESCRIPTION.—Ovoid, laterally compressed, 4 to 5 m. m. long; carpels usually cohering and attached to a slender pedicel; grayish or greenish-gray to grayish brown; each with a flat face and five light brown filiform ridges and about 16 oil-tubes; odor and taste agreeable and aromatic. The anise berries are dried and ground, this being the form in which it is usually used.

DOSE.—Horses and cattle, 1 to 2 oz.; sheep and pigs, 2 to 3 dr.; dogs, 10 to 30 gr.

OLEUM ANISI—OIL OF ANISE

A volatile oil distilled from the fruit of star anise.

PROPERTIES.—A colorless or pale yellow, thin and strongly refractive liquid, having the characteristic odor

of anise, and a sweetish, mildly aromatic taste. Specific gravity about 0.975 to 0.985. Soluble in an equal volume of alcohol.

Dose.—Horses and cattle, 20 to 30 m.; sheep and pigs, 5 to 10 m.; dogs and cats, 1 to 5 m.

Actions.—Anise is an aromatic stimulant, stomachic and carminative. It is used to relieve indigestion and flatulence, to communicate an agreeable flavor to many medicines, and to diminish the griping of purgatives. Oil of anise resembles in action other volatile oils.

Uses.—The oil of anise is employed with olive oil or alcohol to kill fleas or lice on dogs, rubbed over the skin; and one drop of the pure oil may be placed on the feathers of fowl to cause destruction of lice. The oil of anise is sometimes prescribed to disguise the odor of drugs, and is ordered in cough mixtures for its expectorant properties.

The fruit is given all animals (generally powdered) on their food—frequently with sodium bicarbonate and ginger—to relieve mild forms of indigestion and flatulence through its stomachic and carminative effects.

ANTIMONII ET POTASSII TARTARS—ANTIMONY AND POTASSIUM TARTRATE—TARTAR EMETIC

Derivation.—Make a white paste with cream of tartar, antimony trioxide and water. Set aside 24 hours, boil in water 15 minutes and crystallize.

Properties.—Colorless, transparent crystals of the rhombic system, becoming opaque and white on exposure to the air, or a white granular powder without odor and having a sweet, afterwards disagreeable, metallic taste. Soluble in water, insoluble in alcohol.

Dose.—Horses and cattle, 2 to 4 dr.; sheep, 2 to 5 gr.; pigs, ½ to 1 gr.; dogs, 1/10 to ½ gr. As an emetic for pigs, 4 to 10 gr.; dogs, 1 to 2 gr.

Actions.—Tartar emetic is a systemic and local emetic, a diphoretic, cardiac and arterial sedative and a gastro-intestinal irritant. It is a powerful waste producer and stimulates the secretions of the stomach, in-

testines, salivary glands, liver and pancreas. Large doses cause nausea, vomiting and diarrhoea, while toxic doses are followed by vomiting (in animals that can vomit), serious blood purging, great depression of the circulation and respiration weakness, collapse and death. Tartar emetic is also a vermifuge.

Uses.—Tartar emetic is too mild as an emetic in poison cases. In asthma of dogs it may be used in from 1/10 to ½ grain doses to relax spasm and promote secretion. For horses its most valuable use is to expel the common round worms from the intestines, for which it is very efficacious; given in two drachm doses once or twice daily in the feed for four to six days, or one-half ounce dissolved in water is given on an empty stomach followed by a full dose of linseed oil.

ANTIPYRINA—ANTIPYRIN

Phenyl-hydrazine is acted upon by aceto-acetic ether, when phenly-monomethyl-pyrazolon, ethyl alcohol and water results.

Properties.—Colorless, ordorless, scaly crystals, of a bitterish taste. Soluble in water, ether and chloroform.

Dose.—Horses and cattle, 3 to 4 drs.; sheep and pigs, ½ to 1 dr.; dogs, 5 to 20 grs.

Actions.—Powerful antipyretic, anodyne and local anesthetic, antiseptic, cardiac depressant; it reduces temperature very quickly, usually within half an hour and the effects continue two or more hours. It can be administered by the mouth, hypodermically or intertracheally; as an antiseptic it diminishes oxidation, and promotes heat loss by dilating the cutaneous vessels, but more probably by depressing the activity of the calorefacient centers.

Uses.—Used in high fever where the temperature must be reduced quickly, as in sun-stroke, acute rheumatism; in man a solution of antipyrine from four to ten per cent strength up, is sprayed into the nostrils for hay-fever. Acetanilide is a better and safer and much cheaper drug for febrile diseases.

AQUA AMMONIAE FORTOR—STRONGER AMMONIA WATER

An aquous solution of ammonia containing twenty-eight per cent, by weight of the gas.

Derivation.—Evolve ammonia gas by heating ammonium chloride with calcium hydrate and pass it into water.

Properties.—A colorless, transparent liquid, having an exeecessively pungent odor and a caustic alkaline taste.

Dose.—Horses and cattle, 2 to 4 drs.; sheep and pigs, ½ to 1 dr.; dogs, 5 to 10 m. Should be diluted one drachm to one pint of water.

AQUA AMMONIAE—AMMONIA WATER

An aquous solution containing ten per cent by weight of ammonia gas.

Derivation.—Same as strong ammonia water.

Properties.—The taste is not so caustic and the odor is less pungent then the stronger water of ammonia.

Dose.—Horses and cattle, ½ to 1 oz.; sheep and pigs, 1 to 2 drs.; dogs, 10 to 20 m. Should be diluted one drachm to half pint of water.

SPIRITUS AMMONIAE—SPIRIT OF AMMONIA

A alcoholic solution containing ten per cent., by weight of the ammonia gas.

Derivation.—A solution of caustic ammonia in alcohol.

Properties.—A colorless liquid, having a strong odor of ammonia. This preparation of ammonia possesses properties of ammonia and alcohol.

Dose.—Horses and cattle, ½ to 1 oz.; sheep and pigs, 1 to 2 drs.; dogs, 10 to 20 m. Should be diluted in water.

SPIRITUS AMMONIAE AROMATICUS—AROMATIC SPIRIT OF AMMONIA

DERIVATION.—Ammonium carbonate 3.4%, aqua ammonia 9%, oil of lemon 1%, oil of lavender flowers 0.1%, oil of nutmeg 0.1%, alcohol 70%, and distilled water to make 100 parts. Diluted in water.

PROPERTIES.—A nearly colorless liquid when first prepared, but gradually acquires an amber color. It has a pungent ammonial odor and taste.

ACTIONS.—These four proportions of ammonia are gastic and general stimulants. They stimulate the cardiac respiratory and spinal systems. They irritate the nose when inhaled, but reflexly they stimulate the circulation and respiration, they are good stimulants as they do not affect the brain. The aromatic spirits of ammonia is also a carminative. Externally they are rubefacients, and when confined are vesicants.

USES.—Its antacid and stimulant properties recommend ammonia in indigestion, trympanites, and spasmodic colic, especially in cattle and sheep. Stimulating the spinals and respiratory systems; it is valuable in the treatment of influenza, pneumonia, pleurisy and similar complaints. The fumes of ammonia are occasionally used to arouse animals from shocks, collapse, or chloroform intoxication, but must be used cautiously, lest excessive irritation of the respiratory mucous membrane be produced. It is a promptly acting antidote in poisoning by opium, aconite, digitalis, and ether narcotic and sedative drugs. It may be administered much diluted in the usual way, injected subcutaneously and intravenously, and also applied externally, in the treatment of snake-bites. On account of its producing bronchial secretion, and assisting in its expulsion, ammonia is serviceable as a stimulating expectorant. To develop its more general effects its alcoholic proportions should be prescribed as spirit of ammonia or the aromatic spirit of ammonia. Externally used in the form of liniment of ammonia, with oils, camphor, etc., proves useful as a stimulant in rheumatism, stiff-joints, muscular

strains, sore throat, pleurisy, pneumonia and influenza, and for preventing the rapid chilling of fomented surfaces. It relieves the irritation caused by nettles, and by bites and stings of insects.

LINIMENTUM AMMONIAE—AMMONIA LINIMENT

Is made by mixing ammonia water, 350; cottonseed oil, 570; alcohol, 50; oleic acid, 30. The above is recognized by the U. S. P. and is advantageously used on muscular strains and where an external stimulant is indicated.

LIQUOR AMMONII ACETATIS—SOLUTION OF AMMONIUM ACETATE

An aqueous solution of ammonium acetate containing about seven per cent of the salt, together with small amounts of acetic acid and carbon dioxide.

Derivation.—Ammonium carbonate is gradually added to cold, dilute acetic acid until the latter is materialized.

Properties.—A clear, colorless liquid, mildly saline and acidulous taste, and an acid reaction.

Incompatible with acids and alkalies.

Dose.—Horses and cattle, 2 to 4 oz.; sheep and pigs, ½ to 1 oz.; dogs, 2 to 6 drs.

Actions.—Diphoretic, antipyretic, mild stimulant, mild duretic, mild expectorant and stomachic.

Uses.—Its uses are recommended in febrile and inflammatory attacks, especially in influenza, distemper, etc., combined with other medicines, improves the appetite; can be used externally as a refrigerant over swollen and inflamed tendons.

AMMONII CARBONAS—AMMONIUM CARBONATE

Derivation.—A mixture of ammonium chloride or sulphate, and calcium carbonate, is sublimed and resublimed. Ammonium carbonate, so-called, is a mixture of ammonium carbonate and bicarbonate.

Properties.—White translucent masses, having a

strongly ammonical odor, and a sharp saline taste. On exposure to air it loses both ammonia and carbonic dioxide, soluble one part in four parts of water.

Doses.—Horses and cattle, 1 to 3 drs.; sheep and pigs, ¼ to 1 dr.; dogs, 2 to 8 grs. Larger doses are recommended when a antispasmodic or carminative is desired the dose for horses and cattle can be increased to an ounce, but only two doses should be administered, well diluted in water or in ball or capsule.

Actions.—Ammonium carbonate is decomposed by acid in the stomach and escapes in the urine. It stimulates gastric secretion, vascularity and motion, and exciting intestinal paristalsis. It is, therefore, a stomachic and carminative. It is also an antacid, and, in large doses, an emetic for dogs. It is given in capsules or in solution in cold water, to avoid irritating fumes; also with syrup or gruel. It is often prescribed with other stimulants and antispasmodics, as alcohol, camphor, capsicum and asafoetida. The action of ammonium carbonate is almost identical with that of ammonia water in stimulating the heart and respiration, but it has more power in augmenting the bronchial secretions.

Uses.—It is given to all animals in indigestion; conjoins the actions of an antacid and diffusible stimulant; in small doses promotes secretion of gastric juice, and in larger, relieves flatulence and spasm. In diseases of the air passages it is used as an expectorant; is contraindicated in purpura haemorrhagica, as it lowers the oxygens, carrying power of red blood corpuscles, and dissolves fibrin. As a stimulant it can be combined with alcohol and sulphuric ether. Ammonia is recommended where a clot, thrombi or embolism is supposed to exist on account of its defibrinating power Ammonium carbonate is used extensively in the treatment of spasmodic and flatulent, colic and acute indigestion conjoined with either asafoetida, capsicum, camphor, nux vomica and alcohol.

AMMONII CHLORIDIUM—MURIATE OF AMMONIA—SAL AMMONIAC

Derivation.—This salt may be formed by neutralizing crude solution of ammonia or ammonium carbonate with hydrochloric acid and purifying the product.

Properties.—A white, crystalline powder without odor, having a cooling, saline taste, and permanent in the air. Soluble in two parts of water; in fifty parts alcohol.

Doses.—Horses, 1 to 2 drs.; cattle, 4 drs. to 1 oz.; sheep and pigs, 15 grs. to 1 dr.; dogs, 5 to 10 grs.

Actions.—Internally it is an expectorant, alterative, feebly diaphoretic and diuretic. When ingested, ammonium chloride is a feeble heart and respiratory stimulant, and is not comparable to the ammonia compounds or ammonium carbonate in this respect. It is eliminated in great part unchanged by the urine, but also by the other channels. In its excretion it stimulates the mucous membranes, increases their secretion generally, and is thought to improve their nutrition. Ammonium chloride both excites the secretion of the bronchial mucous membrane and renders it less viscid in inflammatory conditions. Externally it is a refrigerant.

Uses.—Useful in all diseases where an expectorant is indicated, catarrhal condition, pneumonia, coughs, influenza, chronic congestion of the liver, etc. Used externally one part ammonium chloride dissolved in ten parts of water as a refrigerant lotion for inflammatory swellings, bruises and sprains.

ARGENTI NITRAS—SILVER NITRATE

Derivation.—Dissolve silver in nitric acid with heat. Evaporate and crystallize.

Properties.—Colorless, transparent, tubular, rhombic crystals, becoming gray, or grayish-black on exposure to light in the presence of organic matter; without odor, but having a bitter, caustic and strongly metallic taste; soluble in water and alcohol.

DOSE.—Horses and cattle, 5 to 10 grs.; sheep and pigs, 1 to 2 grs.; dogs, $\frac{1}{8}$ to $\frac{1}{2}$ gr.

ARGENTE NITRAS MITIGATUS — MITIGATED SILVER NITRATE

DERIVATION.—Melt silver nitrate, 30 parts, with potassium nitrate, 60 parts, in a crucible at as low a temperature as possible. Mix and cast into suitable moulds.

PROPERTIES.—A white, hard, solid, generally in the form of pencils or canes of a finely granular fracture; becoming gray or grayish-black on exposure to light in the presence of organic matter; odorless, having a caustic, metallic taste. Soluble in water and alcohol.

ARGENTI NITRAS FUSUS—MOULDED SILVER NITRATE—LUNAR CAUSTIC

DERIVATION.—Melt silver nitrate, 100 parts, with hydrochloric acid, 4 parts at as low a temperature as possible. Mix and pour into suitable moulds.

PROPERTIES.—Practically same as mitigated silver nitrate. Use only externally.

ACTIONS.—Silver nitrate combines with the albumen of the tissues, and is a limited caustic; causes superficial inflammation and stains the parts black; small doses increase secretion and stimulate the heart. It promotes nutrition, and is said to be a nerve tonic. Its continued administration causes waste, gastro-intestinal catarrh, fluidity of the blood, slate colored lines about the gums, and similar discoloration of the skin and mucous membrane, followed by nervous disorder, paralysis, convulsions and death.

USES.—A solution of forty grains to one ounce of spirit of nitrous ether is said to abort superficial inflammation, if early applied; used for erysipelas, twenty grains to one ounce of distilled water, applied around margin to limit the area; also used in ulceration of the throat; used with a spray or swab, in strength of from ten grains to one-half to drachm to one ounce of distilled water. For dysentery, internally and as an enema

it is very good; used in conjunctivitis one to five grains to one to two ounces of distilled water, is the average strength, and should only be applied to the conjunctiva or lids, and should not be on the cornea, as it may form an insoluble chloride of silver and cause permanent opacities. Nitrate of silver is used in the form of lunar caustic to stimulate indolent ulcers, and to burn off warts.

To stimulate ulcers, touch in spots around the edge; also used in chorea epilepsy and chronic spinal disease, foot rot in sheep; a piece of the caustic is placed in senuses of fistulous withers, quittors, etc. It causes a slough, followed by healthy granulation; used for sore teats in cows.

ARNICAE—ARNICA

Origin.—Arnica is obtained from the flower roots of a plant that grows in mountainous countries of Central Europe, Asia and America.

Composition.—An active principle called arnicin. The root contains an essential oil, on which depends in great part its physiological activity.

PREPARATIONS

EXTRACTUM ARNICAE RADICIS—EXTRACT OF ARNICA ROOT (NON-OFFICIAL)

Dose.—Horses and cattle, 15 grs. to 1 dr.; sheep and pigs, 5 to 10 grs.; dogs, ½ to 3 grs.

FLUIDEXTRACTUM ARNICAE RADICIS—FLUIDEXTRACT ARNICA ROOT (NON-OFFICIAL)

Dose.—Horses and cattle, 1 to 3 drs.; sheep and pigs, ½ to 1 dr.; dogs, 2 to 10 ms.

TINCTURA ARNICAE—TINCTURE OF ARNICA

This is the best and most used preparation of Arnica.

Dose.—Horses and cattle, 2 to 4 drs.; sheep and pigs, 15 ms. to 1 dr.; dogs, 5 to 30 ms. This dose can be given every three hours to maintain the circulation

of the skin; as a diaphoretic, the dose can and may be increased and combined with other diaphoretics.

INCOMPATIBLES.—Its action is antagonized by ammonia, alcoholic stimulants, opium, camphor, etc.

SYNERGISTS.—Aconite, veratrum viride, digitalis and arterial sedatives, generally increase the effects of arnica.

ACTIONS.—Arnica is irritant, stimulant, depressant; antipyretic, diuretic, diaphoretic and is used as a vulnerary, it dilates the circular blood vessels. It irritates the gastro-intestinal tract. In alcoholic solutions (as tincture of arnica) it inflames the skin when used full strength.

In small doses it increases the action of the heart, raises arterial tension and stimulates the action of the skin and kidneys.

Large doses produce a transient excitement, followed by depressed circulation, respiration and temperature.

USES.—It is a very efficient diaphoretic for horses in one or two ounce doses diluted in one pint of water; one-half ounce of fluid extract piloarpus may be added at the outset of inflammatory diseases of any kind, such as lymphangitis, laminitis, pulmonary diseases, etc. Excellent to stop a chill and prevent the following fever or inflammatory action. It does this by dilating the blood vessels of the skin, thus attracting the blood to the surface and away from congested internal organs. It is indicated in sthetic fever of any kind; azoturia, rheumatism, especially inflammatory or articular; congestion of the brain, kidneys, etc., externally much used, but of little value on hairy animals.

ARSENUM—ARSENIC

ORIGIN.—The world's supply of arsenic and arsenic compounds at the present time is obtained from Germany, Spain, England, Canada and portions of the United States, as Montana and Washington, where considerable quantities of arsenic are being produced as a by-product in the smelting of copper ores. Arsenic ore is roasted and purified by sublimation, before it is used for medical purposes.

ARSENI TRIOXIDUM—ARSENIC TROXIDE ACIDUM ARSENOSUM — ARCENOUS ACID (White Arsenic)

Derivation.—Arsenical ores are roasted or conducted into condensing chambers and purified by sublimation.

Properties.—A heavy solid, occurring either as an opaque, white powder, or in irregular masses of two varieties; the one amorphous, transparent and colorless, like glass; the other crystalline, opaque, and white, resembling porcelain. Frequently the same piece has an opaque, white outer crust enclosing the glassy variety. Contact with moist air gradually changes the glassy into the white opaque variety. Both are odorless and tasteless. The glassy variety dissolves slowly in thirty parts of water; the porcelain-like in eighty parts of water. Arcenous acid is sparingly soluble in alcohol, but soluble in glycerin, hydrochloric acid and solutions of the alkali hydrates and carbonates. When heated to 424°, arcenous acid is completely volatilized without melting.

Incompatibles.—Lime water, salts of iron and magnesia.

Dose.—Horses, 1 to 5 grs.; cattle, 2 to 8 grs.; sheep and pigs, 1 to 2 grs.; dogs, 1/30 to 1/10 gr.

LIQUOR POTASSII ARSENTIS—SOLUTION OF POTASSIUM ARSENITE (Fowler's Solution)

Derivation.—Arcenous acid, potassium bicarbonate, compound tincture of lavender and distilled water. Strength one part of arcenous acid in 100.

Dose.—Horses, 2 drs. to 1 oz.; cattle, ½ to 1½ ozs.; sheep and pigs, 10 to 40 ms.; dogs, 2 to 5 ms. Average dose for horse is ½ oz. usually given three times daily in drinking water or bran mash.

LIQUOR ACIDI ARSENOSI—SOLUTION OF ARCENOUS ACID

Derivation.—Arcenous acid, diluted hydrochloric

acid, and distilled water. Strength one part arcenous acid in 100.

Dose.—Same as liquor potassii arsenitis.

LIQUOR ARSENI ET HYDRARGYRI IODIDI (Donovan's Solution)

Derivation.—Arcenous iodide, red mercuric iodide, and distilled water, which should contain not less then one per cent of arcenous iodide and one per cent of mercuric iodide.

Dose.—Same as liquor potassii arsenitis.

Actions.—Arsenic and its compounds are gastro-intestinal and pulmonary tonic, a stimulant and alterative, acting particularly on the digestive and respiratory mucous membranes and skin. It is antiperiodic and tonic; also antispasmodic in diseases of the nervous system, and is a nervine tonic. In large doses it is a corrosive-irritant poison, killing either by gastro-enteritis, or nervous paresis. Continued doses produce fatty degeneration. On account of its being a stomachic, small doses promote the appetite and digestion. Large doses inflame the stomach and derange digestion. It increases the cardiac action, respiratory power, and secretion of the intestines. It also stimulates peristalsis. When tolerance is established, large doses are taken with impunity.

Externally.—Arsenic is a very painful excharotic, exciting violent inflammation. It is a caustic, antiseptic, and parasiticide, and is frequently used as a sheep dip. It is eliminated chiefly by the kidneys, skin and saliva and milk of nursing animals.

Uses.—It should not be given in acute diseases. It is given as a general tonic after debilitating diseases especially when the lungs are involved, as in pneumonia, bronchitis and pleursy. Arsenic combined with bran mashes is beneficial in stocking or swelling of the legs. As for its use in chronic indigestion, other medicines had better be resorted to. It assists in the expulsion of worms. Useful in chronic diseases of the air passage. Arsenic relieves irritable chronic coughs, and roaring in

early stages, as well as thick and broken wind and heaves. As an alterative modifying tissue change it is prescribed in early stages of tuberculosis, chronic rheumatism, chorea and epilepsy. It prevents periodically returning fevers. In anaemia it increases both red and white blood corpuscles. For chorea in dogs, commence with a small dose, three times daily and increase a minimum per dose every third or fourth day until the physiological limit is reached as described under (Toxicology of Arsenic).

Actions on the Skin.—Administered internally it stimulates the dermis and hastens the removal of epidermal cells; hence it is useful in all chronic skin diseases, as chronic eczema, scab, mange and warts. To remove warts that occur in the mouth and on the muzzle of animals, give internally and apply locally. Fowler's solution. In chronic skin diseases use Donovan's or Fowler's solution or acidum arcenosum and sulphur mixed in the feed. Useful internally in successive eruptions of the skin boils and in chronic urticaria.

External Uses.—The white arsenic or arcenous acid is used to slough out tumors, fistulae, quittors, etc. But I would not recommend it as it is too painful. It is valuable in the treatment of foot-rot. The affected animals should be slowly driven through a trough containing a solution of arsenic. It is used extensively for sheep and cattle to destroy ticks. In this way, animals are sometimes poisoned, as it drips on the grass and other animals eat it.

Toxicology of Arsenic.—Full medical doses if long continued, cause edema and itching of the eyelids, increased flow of saliva nausea, diarrhoea or dysentery, weak heart, soreness to the touch over the region of the stomach, itchy skin with small eruptions, jaundice and albuminuria. In long continued doses it diminishes exidation, decomposes albuminoid tissues and produces fatty degeneration; also lessens the glycogenic functions of the liver.

Chronic Arsenical Poisoning.—Is common in the

vicinity of either tin or copper smelting plants. The symptoms are as follows: indigestion thirst, wasting, chronic diseases of joints and bones, the knee joints swell, the animal becomes lame and hide-bound, hair falls off, skin gets rough and scurfy, teeth get black and fall out and necrosis of the bones follow.

Antagonists and Incompatibles.—The salts of iron, magnesia, lime, and astringents, are chemically incompatible. The hydroxide of iron, or as it is also known, hydrate sesquioxide of iron, freshly made and in soft magma is the antidote to arsenic. To dogs give from half to one tablespoonful every five or ten minutes. From eight to twenty grains of the antidote are required to each grain of arsenic swallowed (when it can be determined). The stomach should first be emptied by the use of cathartics or stomach pump and then give the antidote, and follow with demulcents as oil, milk and mucilaginous drinks. Also administer diluents, as weak alkaline water. Iodide of potassium is valuable as a antidote of arsenical poisoning and should be administered to promote elimination of the poison. In the absence of the antidote, chalk, magnesia and lime water may be freely given. These agents act mechanically by developing the poison and preventing absorption. Dialysed iron is recommended as efficacious as an antidote in doses of five to fifteen minimums for dogs.

ASPIDIUM—MALE FERN

Derivation.—The rhizome of Aspidum Filix—mas. Collected late in the autumn, divested of its roots, leaves and dead portions, and carefully dried. Male fern should not be kept more than a year.

Habitat.—The male fern grows wild throughout most temperate regions, on the sides of roads and in open woods, especially where the soil is light.

Properties.—Its root stock is perennial, about a foot long and two inches thick; is scaly, tufted, greenish-brown, and firmly fixed in the ground by numerous black root fibers. The dried root has a disagreeable

odor, and a sweet, astringent, nauseous taste. Powdered male fern should be freshly prepared and have a bright green color.

Dose.—The powdered male fern is given to horses and cattle in doses of 4 to 6 ozs.; sheep and pigs, 1 to 4 ozs.; dogs and cats, ½ to 2 ozs. The powder is bulky, and less certain than the oleoresin of aspedium.

PREPARATIONS

OLEORESINA ASPIDII—OLEORESIN ASPIDIUM—OLEORESIN MALE FERN

Made by percolation with ether, distillation and evaporation of the ether.

Dose.—Horses and cattle, 3 to 6 drs.; sheep and pigs, 1 to 2 drs.; dogs and cats, 15 ms. to 1 dr.

Action and Uses.—Male fern is irritant, vermicide laxative, large doses of the drug cause hemorrhagic gastro-enteritis, tremors, weakness, stupor, coma, acute nephritis and cystitis. Oleoresin of male fern is one of the most effectual remedies for tapeworm, particularly those inhabiting dogs.

BELLADONNAE FOLIA—BELLADONNA LEAVES

Origin.—Belladonna is the leaves of a plant known as deadly nightshade. It grows wild in some parts of Great Britain, and is also cultivated to a great extent. The dried leaves of atropa belladonna yield, when assayed by the U. S. P. process, not less than 0.35 per cent of mydriatic alkaloids. Usually of a dull brownish-green color, the leaves much wrinkled and matted together, frequently with the flowering tops intermixed; odor distinctly narcotic, especially on moistening; taste somewhat bitter and acrid. Contains not less than 0.5 per cent atropine. The powdered leaves are characterized by few hairs and numerous small arrow-shaped crystals of calcium oxalate.

Dose.—Of the powdered leaves, horses and cattle, ½ to 1 oz.; sheep and pigs, ½ to 2 dr.; dogs, 1 to 5 grs.

PREPARATIONS

EXTRACTUM BELLADONNAE FOLIORUM—EXTRACT OF BELLADONNA LEAVES

Made by percolation with dilute alcohol and evaporation to pilular consistence. Used in preparing the unguentum belladonnae. Contains 1.4 per cent of mydriatic alkaloids.

Dose.—Horses and cattle, 10 to 20 grs.; sheep and pigs, 2 to 4 grs.; dogs, 1/8 to 1/2 gr.

TNCTURA BELLADONNAE FOLIORUM—TINCTURE OF BELLADONNA LEAVES

Belladonna leaves 100, dilute alcohol to make 1,000, made by maceration and percolation. (Strength 10%.)

Dose.—Dogs, 3 to 30 ms.

UNGUENTUM BELLADONNAE—BELLADONNA OINTMENT

Extract of belladonna leaves, 10; dilute alcohol, 5; hydrous wool fat, 20; benzoinated lard, 63.

BELLADONNAE RADIX—BELLADONNA ROOT

Derivation.—The dried root of atropa belladonna yielding, when assayed by the U. S. P. process not less than 0.5 per cent of mydriatic alkaloids.

Constituents.—Same as leaves. Contains not less than 0.5 per cent atropine.

PREPARATIONS

FLUIDEXTRACTUM BELLADONNAE RADICIS—FLUIDEXTRACT OF BELLADONNA ROOT

Made by maceration with alcohol and water and evaporation. One cc. of the extract = one gm. of belladonna root. Standardized so that 100 cc. of the fluidextract contain 0.5 gm. of mydridatic alkaloids. This is one of the most reliable preparations of belladonna.

Dose.—Horses, 1 to 2 dr.; cattle, 2 to 3 dr.; sheep and pigs, 10 to 15 ms.; dogs, 1 to 3 ms.

LINIMENTUM BELLADONNAE—BELLADONNA LINIMENT

Made by adding camphor, 50 parts to fluidextract of belladonna to make 1,000 parts (U. S. P.).

ATROPINAE SULPHAS—SULPHATE OF ATROPHINE

An alkaloid obtained from belladonna. As it occurs in commerce, it is always accompanied by small proportion of hyoscyamine extracted along with it, from which it cannot readly be separated.

Derivation.—Atropine is obtained from a strong tincture of the root.

Properties.—A white crystalline powder, very soluble in water and alcohol.

Dose.—Horses, ½ to 1½ grs.; cattle, 1 to 2 grs.; sheep and pigs, 1/20 to 1/12 gr.; dogs, 1/150 to 1/50 gr. The doses should be considerably reduced when used with morphine.

Incompatibles.—Caustic alkalies; antagonize physiologically by pilocarpine and physostigma throughout almost whole range of its influence, and opium within a certain limitation, prevents the respiratory failure, which is the cause of death.

Action.—Belladonna is an irritant narcotic, a mydriatic, an antispasmodic and anodyne. In small doses a cardiac, respiratory and spinal stimulant; in large doses a paralyzer of the sensory and motor nerve endings and a stimulator of the entire sympathetic system.

It produces dryness of the mucous membrane of the throat, mouth, nose and pharynx, and at first lessens the gastric and intestinal secretions, but soon produces them in large quantities. It is anti-galactogogue, that is, it arrests secretion of milk.

The heart rate is at first slowed, but soon becomes very rapid and vigorous, the pulse being doubled in rapidity; arterial tension is raised and the circulation greatly increased.

The pupils are dilated by the local or systemic use of the drug.

The brain is congested by belladonna, a busy delirium being produced, and hallucinations with mental disorder, due to a selective action on the cell of the gray matter.

The spinal cord is stimulated from the second cervical vertebrae to the tenth dorsal, resulting in paralysis of the motor nerves, both central and peripheal, power being lost in hind extermities first. The respiration is increased and the temperature is raised by the increased circulation; metamorphosis is greatly promoted.

Belladonna and atrophine are rapidly diffused and quickly eliminated by the kidneys. By its paralyzing effect on the terminal nerve filaments, it relaxes the bronchial tubes and checks the secretion of the bronchial mucous membrane; it checks secretion of saliva and milk in the same way and causes dryness of the skin.

Uses.—Belladonna and atrophine is indicated anywhere that an antispasmodic and anodyne is needed. Is servicable in catarrh, pharangitis and bronchitis to check secretion in second stage; heaves, especially asthmatic heaves, combined with gelsemium and lobelia, followed by Fowler's Solution; in influenza, it stimulates the weakened heart, besides having other good effects.

In the first stage of respiratory diseases, belladonna alone, or combined with aconite or other febrifuges and expectorants; in cough, especially spasmodic or when due to irritation of the throat; in heart failure or heart weakness, hypodermic injections of atrophine are beneficial; in spasmodic colic one to two drachms of the fluid extract to a dose, but one drachm is usually sufficient; as a powerful antispasmodic and anodyne, atropine and morphine combined; small doses are given in constipation of the bowels, combined with nux vomica; small doses with purgatives are said to aid their action.

In tetanus give one to two drachms of the extract two or three times daily; in paralysis of the throat of tetanus the fluid extract combined with soap liniment or used alone externally; in cerebro-spinal meningitis, belladonna and ergot alternated with aconite is rational treatment, conjoined with the external treatment. It

allays irritations of the bladder, rectum, and uterus, especially if combined with cannabis indica.

In contraction or rigid os the extract applied directly, quickly relaxes and allows parturition; it is well to see if this is necessary before giving ergot.

Used extensively in examinations and diseases of the eye.

Atrophine sulphate is used locally to dilate the pupil, assisting in the detection of cataracts or other disorders of the eye and testing the condition of the refracting media; for dilating pupil use a solution of four grains of the atrophine to one ounce of distilled water; a few drops are placed into the eye, for inflammation of the eye with great irritation; belladonna may be combined with cocaine; in iritis.

Antidote.—In poisoning, tannic acid should be used.

BENZOINUM—BENZOIN

A balsamic resin obtained from styrax benzoin dryander, and another unidentified species of stryrax. It contains benzoic acid in the proportions 12 to 20 per cent to which it probably owes its action.

Habitat.—Southern Asia.

Properties.—In pebble-like bodies or tears, slightly flattened, straight or curved, yellowish to rusty-brown externally, milky-white on fresh fractures internally. Odor agreeable, balsamic; taste slightly acrid. It is almost wholly soluble in five parts of moderately warm alcohol, and in solutions of the fixed alkalies. When heated it gives off fumes of benzoic acid.

Constituents.—Benzoic acid, cinnamic acid; resins and a volatile oil.

PREPARATIONS

ADEPS BENZOINATUS—BENZOINATED LARD

Made by melting lard 1,000, with benzoin 20; and straining, used as an ointment itself, and as a base for other ointments.

TINCTURA BENZOINI—TINCTURE OF BENZOIN

Made by maceration of benzoin 200, in alcohol; filtration and addition of alcohol to make 1,000.

Dose.—Horses and cattle, ½ to 1 oz.; sheep and pigs, 2 to 4 drs.; dogs, 30 to 60 ms.

TINCTURA BENZOINI COMPOSITA—COMPOUND TINCTURE OF BENZOIN

Commonly known as Friar's Balsam. Benzoin, 100; purified aloes, 20; storax, 80; balsam of tolu, 40; alcohol to make 1,000. Made by digestion and filtration.

ACIDUM BENZOICUM—BENZOIC ACID

Derivation.—Obtained from benzoin by sublimation, or artificially prepared.

Properties.—White feathery crystals of a peculiar, agreeable odor, and warm acidulous taste, sparingly soluble in cold water (1 to 500), more soluble in boiling water, 1 in 15, and in 2 parts of alcohol; borax renders it more soluble.

Incompatibles.—Alkalies, ammonium carbonate.

Dose.—Horses and cattle, 2 to 4 drs.; sheep and pigs, ½ to 1 dr.; dogs, 5 to 15 grs.

AMMONII BENZOAS—AMMONIUM BENZOATE

Made by the action of benzoic acid and ammonia water. In white crystals. Soluble in 10.5 parts of water; in 25 parts of alcohol.

Dose.—Same as benzoic acid.

SODII BENZOAS—SODIUM BENZOATE

Made by the action of a hot solution of sodium carbonate of benzoic acid. Occurs in a white powder. Soluble in 1.6 parts of water; in 43 parts of alcohol.

Dose.—Same as benzoic acid.

LITHII BENZOAS—LITHIUM BENZOATE

Made by decomposing lithium carbonate with benzoic acid. It should contain not less than 98.5 per cent

of pure lithium benzoate, and should be kept in a well stopped bottle. Soluble in 3 parts of water, and in 13 parts of alcohol.

Dose.—Same as benzoic acid.

Actions.—Benzoin is a mild stimulant, expectorant and antiseptic; benzoic acid is quite powerful; it renders alkaline urine acid; it is used to dissolve phosphatic calculi.

Uses.—The tincture and compound tincture are used as stimulants and antiseptics for wounds and sores. Benzoic acid, when administered internally, acts mildly as an antiseptic to the bladder; useful in catarrh of the bladder. Benzoate of soda is used in bronchial catarrh. Benzoate of ammonia is used to dissolve phosphatic calculi. Lithium benzoate has been highly recommended as a remedy for rheumatic effections.

CALAMUS—SWEET FLAG

The unpeeled, dried rhizome of acorus calamus Linne.

Habitat.—United States, Europe, Western and Southern Asia, including India and Japan.

Properties.—The leaves as well as the root have an aromatic odor; but the root only is employed. It should be collected late in the autumn, or in the early spring. After removal from the ground, the roots are washed, freed from their fibers, and dried with moderate heat. By drying they lose nearly one-half their diameter, but are improved in odor and taste.

Constituents.—Acorin, a liquid, yellow glucoside, having a bitter taste; a volatile oil; calamine; choline.

Dose.—Horses and cattle, 1 to 2 ozs.; sheep and pigs, 1 to 3 drs.; dogs, 15 grs to 1 dr.

PREPARATIONS

FLUIDEXTRACTUM CALAMI—FLUID-EXTRACT OF CALAMUS

Made by maceration, percolation and evaporation.

Dose.—Horses and cattle, 1 to 2 ozs.; sheep and pigs, 1 to 3 drs.; dogs, 15 ms. to 1 dr.

ACTION AND USES.—Calanus is a feeble aromatic bitter, and is therefore useful in loss of appetite and indigestion associated with mild forms of flatulence. The powdered root is used as a base in powders, balls and electuaries. It is harmless, and the dose is therefore unimportant.

CALX LIME—CALCIUM OXIDE

DERIVATION.—Prepared by burning white marble, oyster shells, or the purest varieties of natural calcum carbonate; to expel carbon dioxide.

PROPERTIES.—Lime is in hard, white or grayish-white masses, which in contact with air gradually attract moisture and carbon dioxide and fall to a white powder; odorless; of a sharp caustic taste. Soluble in water; insoluble in alcohol.

ACTIONS.—Antacid, gastric sedative, intestinal astringent, desiccant.

USES.—Its principal use is in diarrhoea, combined with opium tannic acid, also antiseptics; makes a very good dusting powder over abraided surfaces. Lime water and milk equal parts and sweetened is very good for puppies raised on a bottle as it is easily digested.

LINIMENTUM CALCIS—LIME LINIMENT
(Carron Oil)

Composed of lime water and raw linseed oil equal parts; is very good for burns. Carron oil given internally is a good, mild laxative and antacid for horses with heaves. It is given on the food. It is also an excellent purgative for foals and calves in the treatment of diarrhoea and indigestion.

CALUMBA

The dried transversely cut slices of the root of Jaterorhiza Columba.

HABITAT.—Mozambique, East Africa. Cultivated in the East Indies.

PROPERTIES.—Odor slight, taste bitter. It contains

calumbin, a neutral bitter, crystalline substance; an alkaloid, berberine; calumbic acid and starch.

Dose.—Horses and cattle, ½ to 1 oz.; sheep and pigs, 1 to 2 drs.; dogs, 5 to 30 grs.

PREPARATIONS

FLUIDEXTRACTUM CALUMBAE—FLUIDEXTRACT OF CALUMBA

Made by maceration and percolation with alcohol and water, and evaporation.

Dose.—Same as columba.

TINCLURA CALUMBAE—TINCTURE OF COLUMBA

Made by maceration and percolation of calumbae, with alcohol and water.

Dose.—Horses and cattle, 2 to 4 ozs.; sheep and pigs, ½ to 1 oz.; dogs, 1 to 2 dr.

Actions and Uses.—Calumba is a bitter, gastric stimulant and carminative. It promotes secretion of gastric juice and improves the appetite. As it contains no tannin it is devoid of astringency and may be prescribed with preparations of iron. Like qussia, calumba infusion may be used to destroy worms in the horse's rectum.

CAMBOGIA—GAMBOGE

A gum-resin obtained from garcinia hunburii Hooker filius (nat. ord. guttiferae).

Habitat.—Southern Asia.

Properties.—In cylindrical pieces, usually hollow in the center, externally grayish orange-brown, longitudinally striate; fracture conchordal, orange-red, waxy and somewhat p orous; inodorous; taste very acid. Powder bright yellow, sternutatory, containing few or no starch grains. Not more than 25 per cent should be soluble in alcohol; ash not more than 3 per cent.

Dose.—Horses, ½ to 1 oz.; cattle, 1 to 1½ oz.; sheep and pigs, 20 grs. to 1 dr.; dogs, 5 to 10 grs.

Actions.—Gamboge is a drastic, hydragogue purga-

tive, and slightly diuretic. Its action is uncertain and often violent, with production of griping pains. Large doses cause vomiting in the dog and gastro-enteritis in all that cannot vomit. Gamboge is dissolved by the bile and alkaline intestinal juices and some of it is absorbed, since it colors the urine yellow in its elimination and occasions diuresis.

Uses.—Gamboge should never be prescribed alone. It has been recommended in obstinate constipation, indigestion, impaction of the third stomach, and brain diseases of cattle, conjoined with salts, or rubbed up with water and an equal amount of aloes (each one ounce).

CAMPHORA—CAMPHOR—GUM CAMPHOR

Derivation.—Camphor is obtained from a tree known as Laurel Camphor. The branches are cut and boiled in water and the camphor rises to the top in the form of gum.

Habitat.—Japan, China and Sunda Islands.

Properties.—White translucent masses, of a tough consistence and a crystalline structure, readily pulverizable in the presence of a little alcohol ether or chloroform; having a penetrating characteristic odor, and a pungent aromatic taste. Very sparingly soluble in water, but readily soluble in alcohol, ether, chloroform carbon disulphide, petroleum, benzine and in fixed and volatile oils. On exposure to the air, it evaporates more or less rapidly at ordinary temperatures, and when moderately heated, it sublimes without leaving a residue.

Dose.—Horses, 1 to 3 drs.; cattle, 2 to 4 drs.; sheep and pigs, 15 grs. to 1 dr.; dogs, 3 to 30 grs.

PREPARATIONS

AQUA CAMPHORAE—CAMPHOR WATER

Tincture camphor 8, with alcohol 8 and purified talc 15; then with water to make 1000 filter.

Camphor water has this advantage over camphor in substance, that the latter is with difficulty dissolved by liquids of the stomach; but it is too feeble a preparation for use when a decided effect is desired; it is, however,

an excellent vehicle for the administration of more active substances.

Dose.—Ad lib.

SPIRITUS CAMPHORAE—SPIRIT OF CAMPHOR

Made by dissolving gum camphor, 100, in alcohol, 800; filter and add alcohol to make 1000.

Dose.—Horses and cattle, 1 to 2 oz.; sheep and pigs, 2 to 4 dr.; dogs, 30 grs. to 1 dr. Spirit of camphor is frequently prescribed in colic mixtures.

LINIMENTUM CAMPHORAE—CAMPHOR LINIMENT—CAMPHORATED OIL

Made by adding camphor, 200 parts to cottonseed oil, 800 parts.

It is a mild rubefacient; is used in cough mixtures, also used locally in liniments.

CERATUM CAMPHORAE—CAMPHOR CERATE

Composed of camphor liniment, 100 parts, white wax 350 parts, white petrolatum 150 parts, lard 400 parts.

For external use only.

LINIMENTUM SAPONIS—SOAP LINIMENT

Composed of soap 60 parts, camphor 45 parts, oil of rosemary 10 parts, alcohol 725 parts, water to make 1000 parts; for external use only, as a mild stimulating and anodyne liniment, usually combined with other medicines and used for its stimulating properties.

CAMPHORA MONOBROMATA — MONOBROMATED CAMPHOR

Derivation.—Made by heating camphor and bromine in the proper chemical proportions for three hours in a sealed tube, in a water bath. The crystalline masses washed with water, recrystallized from alcohol after treatment with animal charcoal, washed

with an alcoholic solution of potassium hydroxide, then with much water and finally recrystallized from a mixture of alcohol and ether. It is very easy to prepare the monobromide on a small scale in this way.

PROPERTIES.—Colorless, prismatic needles or scales, permanent in air, almost soluble in water, freely soluble in alcohol, ether, chloroform and fixed and volatile oils; used frequently as an anaphrodisiac.

DOSE.—Dogs, 2 to 10 gr.

ACTIONS.—Antispasmodic or nerve stimulant, anodyne, antiseptic, diaphoretic, a stimulant, expectorant, a cerebral excitant or narcotic, a gastro-intestinal irritant, a rubefacient or counter-irritant and also carminative. It has an acrid hot taste, irritates the skin and mucous membrane, large doses causing gastro-intestinal inflammation.

Medical doses stimulate the vaso-motor system and the cardic-motor ganglia, and lessens the influence of the pneumogastric (inhibitory nerve); afterwards stimulates the accelerator apparatus, thus increasing the circulation and raising arterial tension; it also stimulates respiration, and in man stimulates mental activity even to intoxication.

USES.—In catarrhal conditions, cough mixtures, acute and chronic bronchitis, pneumonia. The spirits of camphor is used in colic mixtures; also locally to stop secretions of milk applied frequently; in cardiac weakness; stangury may be relieved by one to two ounce doses of the spirits for the horse. Spirits of camphor is used in Thumps.

Camphor is a valuable medicine in diarrhoea, particularly in serious variety, and in that form following exposure to cold. It is not useful in inflammatory conditions, but checks secretions and pain.

Spirit of camphor and nitrous ether are efficient in relieving irritation of the genito-urinary tract. Camphor has proven of service in purpura hemorrhagica of horses given three times daily in capsules or pills.

CANTHARIS — CANTHARIDES — SPANISH FLY—BLISTER BEETLES

DERIVATION.—Cantharides is obtained from flies which receive the name Spanish Fly on account of so many of them coming from Spain, but they are also imported from Germany and Russia; living chiefly on climbing shrubs and trees.

DESCRIPTION.—About 20 to 25 m. m. long and about 6 mm. broad, flattish cylindrical, with filiform antennae, black in the upper part, and with long wing-sheaths, and ample membranous, transparent, brownish wings, elsewhere of a shining, coppery-green color. The powder is grayish-brown, and contains green shining particles. Odor strong and disagreeable; taste slight, afterwards irritating. Cantharides deteriorate with age and should be kept unpowdered in tightly stoppered bottles.

DOSE.—Of the powdered fly, horses and cattle, 5 to 10 gr.; sheep and pigs, 3 to 6 gr.; dogs, ½ to 2 gr.

TINCTURA CANTHARIDIS—TINCTURE OF CANTHARIDES

Prepared by percolation of powdered cantharides, 100 parts, with alcohol to make 1000 parts.

DOSE.—Horses and cattle, 2 to 4 dr.; sheep and pigs, 15 to 30 m.; dogs, 2 to 15 m.

ACTIONS.—Externally, is rubefacient, irritant, vesicant, according to the strength used, it promotes water blister; counter-irritant, etc. Cantharides acts more powerfully on the skin of horses and dogs than on that of cattle and swine. If applied over an extensive surface, absorption and poisoning may occur.

Internally cantharides is an irritant, and produces its effects on any part which the free cantharidin is brought into contact. When swallowed it irritates the digestive mucous membrane; large doses produce gastro-enteritis. The active cantharidin is absorbed, and in the blood forms a non-irritant albuminoid, but in the kidneys is again liberated, developing its characteristic irritation, medical doses stimulating the urino-genital tract, causing diuresis, and in some animals increases

sexual appetite; full doses induce inflammation, slow and painful discharge of bloody urine.

Uses.—Externally cantharides is employed as a blister rubefacient or as a counter-irritant; blisters are formed in from two to eight hours. If repeatedly used it may cause sloughing of the tissue; cantharides may be used wherever a blister or counter-irritant is required, except in inflammation of the urinary organs, as it is absorbed and will increase the inflammation. Cantharides conjoined with red mercurous iodide and adaps is usually employed in the treatment of diseases of the bones, joints, bursae, ligaments and tendons. In exostoses, as bone spavin and ring bone, used most effectively after the actual cautery, to secure absorption and resolution, or anchylosis. Always clip off the hair close before applying a blister, tie or muzzle the animal so he cannot bite it; leave blister on forty-eight hours, then wash and grease the parts daily. A cantharides blister is sometimes beneficial in hastening the formation of abscess (distemper); also to stimulate indolent ulcers or wounds; it causes swelling and closes the opening of small umbilical hernias of foals and calves. It is also valuable in closing and sealing punctured wounds into joints and synovial cavities. The tincture of cantharides can be applied once or twice daily, full strength, when the exudation of much serum is desired. Cantharides is seldom used internally except in incontinuence of urine from debility or partial paralysis of the bladder. Seldom used to increase sexual desire. The tincture of cantharides should be employed when the drug is administered internally.

CAPSICUM—RED PEPPER—CAYENE PEPPER

The dried ripe fruit of Capsicum fastigiatum Blume deprived of its calyx.

Habitat.—Tropical America; cultivated also in other tropical countries.

Properties.—Capsicum when ground has a hot, pungent, spicy taste.

CONSTITUENTS.—Capsicum contains capsaicin, a crystallizable, acrid body; capsicin, a volatile alkaloid; a fixed oil; fatty matter; resin.

DOSE.—Horses, 20 gr. to 1 dr.; cattle, 1 to 2 dr.. sheep and pigs, 5 to 10 gr.: dogs, 1 to 5 gr.

PREPARATIONS

FLUIDEXTRACTUM CAPSICI—FLUID EXTRACT OF CAPSICUM

Made by maceration and percolation with alcohol, and evaporated, so that 1 cc. equals 1 gm. of the crude drug.

DOSE.—Horses, 10 m. to 1 dr.; cattle, 1 to 2 dr.; sheep and pigs, 5 to 10 m.; dogs, 1 to 5 m.

TINCTURA CAPSICI—TINCTURE OF CAPSICUM

Made by percolation of capsicum, 100, with alcohol and water to make 1,000.

DOSE.—Horses, 2 to 4 dr.; cattle, ½ to 1 oz.; sheep and pigs, 20 m. to 1 dr.; dogs, 5 to 30 m.

OLEORESINA CAPSICI—OLEORESIN OF CAPSICUM

Made by percolation with acetone, distillation and evaporation of the residue.

DOSE.—Horses, 10 to 30 m.; cattle, ½ to 1 dr.; sheep and pigs, 1 to 5 m.; dogs, ½ to 1 m.

ACTION AND USES.—Capsicum and its preparations are irritants, stimulating stomachics, carminatives and rubefacients. Large doses, especially in carnivora and omnivora, are irritant poisons, inflaming the alimentary and sometimes also the urino-genital mucous membranes. Properly regulated doses are indicated in atonic indigestion and flatulent colic in horses combined with ammonium carbonate. It may be advantageously combined with bitters, as nux vomica. Capsicum is a favorite stimulant and tonic remedy—to the digestion—with poultry fanciers. It also increases the laying of eggs when given to hens. Externally capsicum is rube-

facient and counter-irritant, producing about the same degree of irritation as mustard, but causing considerable pain. It ought not be used for blistering ointments or for setons.

CHLOROFORMUM—CHLOROFORM

A liquid consisting of 99 to 99.4 per cent, by weight, of absolute chloroform, and 0.6 to 1 per cent alcohol.

Derivation.—Alcohol and water are heated in a still to 37.70 C. (100° F.), when chlorinated lime is added and chloroform is evolved.

Properties.—Chloroform is a heavy, clear, colorless, mobile and diffusible liquid, of a characteristic ethereal odor, and a burning sweet taste. Specific gravity not below 1.476 at 25° C. (77° F.). Soluble in 200 times its volume of cold water, and in all proportions in alcohol, ether, benzol, benzine and the fixed and volatile oils. Chloroform is not inflammable. Chloroform should be kept in dark amber colored well stoppered bottles in a cool and dark place.

Dose.—Horses and cattle, 1 to 2 dr.; sheep and pigs, 20 to 40 m.; dogs, 2 to 8 m. Should be well diluted with glycerine, syrup, eggs or diluted alcohol; the above dose can be repeated every two or three hours.

PREPARATIONS

AQUA CHLOROFORMI — CHLOROFORM WATER

A saturated solution of chloroform and distilled water, it should contain one-half per cent of chloroform. Chloroform water has been proven to be an excellent vehicle for administering active remedies, and, owing to its antiseptic properties, mixtures having it for a basis resist decomposition longer than those made with ordinary water. Used extensively as a vehicle in cough and diarrhoea mixtures.

LINIMENTUM CHLOROFORMI — CHLOROFORM LINIMENT

Made from chloroform, 300 parts, soap liniment 700 parts.

SPIRITUS CHLOROFORMI

Made from chloroform 60 parts, alcohol, 940 parts.

Dose.—Horses and cattle, 1 to 2 oz.; sheep and pigs, 2 to 4 dr.; dogs, 20 to 40 m.

CHLOROFORM EMULSUM—EMULSION OF CHLOROFORM

Made from chloroform, expressed oil of almond, tragacanth and water. Should contain four per cent of chloroform. A good agent and vehicle for diarrhoea and vermifuge mixtures for small animals.

Dose.—Dogs, 2 dr. to 1 oz.; cats, ½ to 1 dr.

Actions.—Chloroform is a topical irritant, antiseptic, parasiticide, carminative, antispasmodic and analgesic. Full doses quickly and powerfully paralyze the cerebro-spinal nervous system; chloroform kills by paralyzing the heart and respiration; the latter effects are most rapidly produced when the drug is inhaled. Chloroform is the general anaesthetic most used for veterinary purposes except for dogs.

Externally it is rubefacient if confined or even suppurant. It also acts as a refrigerant, anodyne and local anaesthetic if not confined. It penetrates the skin very readily and on this account is commonly used in liniments to aid in the absorption of other medicines.

Chloroform compared to ether is much more irritating to the mucous membrane, and causes violent gastro-enteritis, if swallowed undiluted; it is less stimulating and more depressing to the heart and circulation. For inhalation it requires much more air; is less irritant to the air passages than ether; is uninflammable, more pleasant, more prompt in action, has a shorter stage of excitement, causes a more profound narcosis, and is not so nauseating as ether and is cheaper. Statistics show it to be five times more fatal than ether.

The results of various experiments show that chloroform and ether both act in the same manner upon the

heart and respiration, paralyzing the latter first; but chloroform acts much more quickly and powerfully than ether in both directions. But when chloroform is inhaled in a concentrated form it generally paralyzes the heart first.

Uses.—Chloroform should be used as an aid in painful and prolonged cases of parturition, especially where you have tumultuous contraction of the uterus, or rigid contraction of the os. Use just enough by inhalation to dull the pain and relax the parts; it will aid you in your efforts to rectify abnormal presentations by relaxing the parts.

Internally it is used in spasmodic and flatulent colic as it is an antispasmodic carminative and anodyne in its effects; chloroform combined with belladonna and opium is very beneficial in spasmodic coughs, given in linseed gruel or water, well diluted; in liniments about one or two ounces to the pint. Chloroform is used in chronic diarrhoea with other medicines, such as morphine, capsicum, camphor, oil of peppermint and ether. It is also a good taeniacide.

ANESTHESIA

Anesthesia is divided into three stages; the stimulant, anaesthetic and paralytic.

In the first stage there is struggling and excitement, due partly to the action of the drug and partly to fright. The local irritant action of the vapor causes choking and coughing, which also induces struggling.

The respiratory and cardiac centers are temporarily stimulated, as a consequence of which the pulse and respiratory movements are increased in force and frequency and blood tension is raised.

The smaller animals, particularly the dog, may vomit during the first stage of anaesthesia. In the first stage the dog may bark, whine or howl, the horse neighs and groans; other animals give expression to sounds more or less characteristic to their species.

The second or anesthetic stage is characterized by

loss of consciousness, sensation, motion and partial loss of reflex action and is that state suitable for operations. The stimulating action of the anesthetic has passed and there is now depression of the cerebral functions, the motor centers. The voluntary muscles are completely relaxed, the sphincters occasionally, the patient lies absolutely motionless, the cornea fails to respond to irritation, i. e., winking is not produced when the cornea is lightly touched with the finger. Sometimes the muscles are rigid and twitching during this stage of anesthesia, though sensation and consciousness are absent. In the anesthesia stage the pulse is slow, full and strong, due to lowered blood pressure, the breathing is slow and shallow but regular.

The third or paralytic stage, which must be carefully watched against, poisoning is beginning and there is depression of the three great medullary center controling the heart, respiration and vascular tension and also the posterior reflex centers of the spinal cord, so that the urine and faeces are passed involuntarily. The passage of urine frequently occurs in the first stages of anesthesia and should not of itself be considered a danger mark. When the pulse becomes rapid, feeble and irregular, the breathing is at first stertorous and then the respiratory movements become shallow and weak, with long intervals intervening between them; this irregularity is a most important danger sign. The skin and mucous membrane often become cold and clammy. The pupils are usually widely dilated, though death may occur with either dilated or contracted pupils and consequently no dependence should be put in this sign unless there has been a sudden change from one condition of the pupils to the other. The three above mentioned stages are conventional, and are not in any case so clearly defined in practice as they are described theoretically upon paper. The first stage may be either absent or prolonged, and the last stage should not be reached at all.

COMPARISON OF ETHER WITH CHLOROFORM

Ether.	Chloroform.
More diffusible.	Less diffusible; vapor heavier.
Inflammable and explosive.	Not inflammable, but vapor decomposes when exposed to a light and causes irritation and some times death.
Stimulant to heart, except in enormous quantities.	Depresses powerfully the heart respiratory and vaso-motor centers in large doses.
Irritating (due to exclusion of air), may induce bronchitis and nephritis.	Less irritating (on account of more air being required for dilution.
Respiratory centers not so easily or suddenly depressed as by chloroform.	Three to five times more dangerous (deaths) than ether.
Larger quantities required.	Smaller quantities required.
Less rapid.	Acts quickly.
More expensive.	Cheaper.
Kills by respiratory failure.	Death from respiratory failure, combined with cardiac depression.

Consequently you can see considering both drugs to be properly administered, all the advantages are in favor of chloroform except safety.

Ether is to be preferred for dogs, cats and other small animals.

Chloroform is especially dangerous for dogs, though horses stand it exceptionally well and it is preferable to

ether in large animals. The safety with which chloroform may be administered to large animals frequently makes veterinarians careless; that is, they "force" the drug; they do not allow sufficient air for dilution, and though the patients may not die from the immediate effects of the drug their existence may be terminated in a few days from pneumonia or broncho-pneumonia (machanical), due to the irritating effects of the drug.

ANAESTHESIA.—It is best to cast the large animals; after complete anaesthesia remove the hobbles.

For dogs make a cone of a towel and paper, put a sponge in the bottom, allowing a small opening in the end to admit air; pour in ether a little at a time.

In brain diseases or tumors of the brain, chloroform is dangerous. Horses with heaves or emphysema should not take chloroform; it is also dangerous in fatty degeneration of the heart. Operations during incomplete anaesthesia, especially with chloroform, are dangerous; always produce complete anaesthesia, have the stomach empty, but don't fast animals for more than two or three meals.

Things to remember when administering an anaesthetic:

The operator must be skilled and give his attention exclusively to the production of anaesthesia, watching the respiration and pulse for signs of failure.

Do not commence operation until anaesthesia is profound, until reflex action is abolished, which can be told by touching the eye with the finger; obey this, no matter how slight the operation. The utmost care should be exercised if the patient is very old or has fatty degeneration of the heart, or lung diseases.

Great care should be exercised in operations about the mouth or trachea. See that no blood passes down the trachea. The stomach and bowels should be empty. This will cause less nausea and feed may be regurgitated and run down the trachea.

When purchasing chloroform or ether for anaesthetic purposes insist on the best; it must be pure.

Ether can be used almost pure, only a little air being necessarily allowed for dilution; chloroform must have a large amount of air.

In all classes of patients the head should be slightly raised, and watch the tongue so that it does not fall back over the larynx and suffocate the animal.

Anaesthesia should be started very slowly; don't force either chloroform or ether.

It is a good practice to have restoratives ready for use before commencing anaesthesia, as aqua ammonia fort., a hypodermic syringe and nitro-glycerin.

CINCHONA

Origin.—Cinchona is obtained from the bark of a tree (Cinchona Calisaya), which grows in South America, East Indies and Jamaica. It contains at least five per cent of its peculiar alkaloids, of which not less than one-half should be quinine sulphate, which is the most important.

Actions.—Cinchona is an astringent. Other than that cinchona and its alkaloids possess the same actions, that being, bitter tonic, stimulant, antiseptic, antiperiodic, antipyretic, antiphlogistic, antimiasmatic, stomachic and antiferment. Large doses are general depressants.

Uses.—Cinchona and its alkaloids are recommended for all classes of patients as bitter stomachic and tonics. They stimulate the appetite, check abnormal gastro-intestinal fermentation and counteract relaxed conditions of the intestines and the accumulations of mucus, which prove favorable to the development of worms.

In troublesome cases of antonic indigestion in horses respond rapidly when quinine sulphate is frequently given in thirty to forty grain doses with half a drachm of dilute nitric or hydrochloric acid. Weak foals and calves suffering from relaxed condition of the bowels, following a dose of castor oil are often much benefited by a few doses of cinchona bark, hydrochloric acid dilute and brandy.

Few medicines are so effectual as cinchona bark or

quinine sulphate in improving appetite and muscular strength and hastening convalescence from debilitating disease.

They are advantageous in anaemia joined with iron salts.

Good results are obtained from cinchona or quinine in the earlier stages of tuberculosis, in septicaemia and pyaemia in all animals; in influenza, protracted cases of strangles, purpura and other similar diseases of the horse; in septic metritis in cows and ewes and in lingering cases of distemper in dogs. Their beneficial effects in these and other diseases probably depending on the action of quinine or micro-organisms or their products. It is often useful in rheumatism conjoined with salicylic acid or potassium iodide. Administered with cathartics, like other bitter tonics, it generally increases their activity. Alternated with cod liver or olive oil and iron, quinine is the best tonic for weak dogs and those suffering from chorea.

Quinine and urea hydrochloride has recently come into use as local anaesthetic. One per cent solutions make a satisfactory substitute for cocaine, etc. It also has advantages over cocaine. It is non-toxic, it may be exposed to a boiling temperature and its anaesthetic effect for dogs after an operation, therefore aiding in dressing of wounds. Its anaesthetic effect comes on within five minutes to half an hour after being injected into the intended seat of operation.

Speaking from practical experience, I prefer quinine and urea hydrochloride to cocaine or any of its allies.

Dose.—Of the powdered cinchona bark: Horses, 2 dr. to 1 oz.; cattle, 1 to 2 oz.; sheep and pigs, 1 to 4 dr.; dogs, 10 gr. to 1 dr.

ALKALOIDAL SALTS OF CINCHONA—QUININAE SULPHAS—SULPHATE OF QUININE

Dose.—As a tonic: Horses, 15 gr. to 1 dr.; cattle, ½ to 1½ dr.; sheep and pigs, 5 to 10 gr.; dogs and cats, 1 to 2 gr. As antipyretic Dose: Horses and

cattle, 2 to 4 dr.; sheep and pigs, 15 gr to 1 dr.; dogs and cats, 5 to 10 gr.

QUININAE ET UREAE HYDROCHLORIDUM —QUININE AND UREA HYDROCHLORIDE (NON-OFFICIAL)

Soluble in 18 parts of water. Use hypodermically as a local anesthetic.

COCAINAE HYDROCHLORIDUM — COCAINE HYDROCHLORIDE

"The dried leaves of Erythroxylon Coca Lamarck (Fam. Erythroxylaceae), known commercially as Huanuco Coca, or of E. Truxillense Rusby, known commercially as Truxillo Coca, yielding when assayed not less than 0.5 per cent of the ether-soluble alkaloids of coca." U. S. "The dried leaves of Erythroxylum Coca, Lam., and its varieties."

Habitat.—Cultivated in Peru and Bolivia and introduced into medicine by Koller in 1884.

Derivation.—Cocaine hydrochloride is recovered by agitating an acidulated alcoholic solution of coca leaves with ether. The etheral liquid is made alkaline with sodium carbonate and evaporated. The residue is purified, deodorized, neutralized with hydrochloric acid and finally crystallized.

Properties.—A colorless, transparent, monoclinic prism, flaky, lusterous leaflets or a white crystalline powder; permanent in air, containing no water of crystallization; odorless; of a saline, slightly bitter taste, and producing on the tongue a tingling sensation followed by numbness of several minutes' duration. Soluble in 0.4 part of water, 2.6 parts of alcohol and in 18.5 parts of chloroform at 25° C. (77° F.); soluble in benzine, petroleum benzine and ether. It leaves no residue on incineration. Its aquous solution is neutral to litmus paper.

Dose.—Horses and cattle, 5 to 20 gr.; sheep and pigs, 1 to 3 gr.; dogs, $\frac{1}{8}$ to 1 gr. Not much used internally.

Action.—Cocaine in small doses is a cerebral, cardiac, respiratory and nervous stimulant and dieuretic; overdoses cause delirium with cardiac and respiratory failure. Cocaine is a powerful local anaesthetic; used for all animals in 4 to 10 per cent solution, usually a 4 to 6 per cent solution is strong enough for ordinary operations. Inject under the skin, into the muscular tissue or over nerve trunks for minor operations. Applied to such structures as the eye, penis, tongue and other delicate mucous surfaces as the uterus, vagina, rectum, etc. It causes profound but temporary anaesthesia over a small area; it causes rapid and extreme dilation of the pupil.

Cocaine is injected for minor operations to prevent pain, such as neurectony, removing tumors, operations on the eyes, tongue, fistulae, firing, etc. For dogs it should be used with great caution, a two per cent solution usually being enough and as little as possible being used.

For the horse, as a rule, not more than two drachms of a five per cent solution should be injected subcutaneously, lest restlessness, excitement, etc., ensue, which though not necessarily dangerous, may interfere with the operation.

In using cocaine as a diagnostic agent for lameness, the fact must not be lost sight of that it is a cerebral stimulant and that if a large quantity is injected it may cause such a degree of excitement as to make the patient forget his lameness, thus leading the operator to believe that the improvement is due to anaesthesia below the point of injection, when the apparent remission from the lameness is of physical origin. Cocaine is advantageously used in painful eye affections. Its effects may be prolonged and the danger of its use lessened by dissolving the cocaine in a 1 to 1000 adrenalin chloride solution.

CRETA PRAEPARATA—PREPARED CHALK

Derivation.—Native calcium carbonate, freed from most of its impurities by elutriation.

PROPERTIES.—A white, amorphous powder, often molded into conical drops; odorless and tasteless; permanent in the air. Almost insoluble in water; insoluble in alcohol.

DOSE.—Horses, 1 to 2 oz.; cattle, 2 to 4 oz.; sheep and pigs, 2 to 4 dr.; dogs, 10 gr. to 1 dr.

PREPARATIONS

PULVIS CRETAE COMPOSITUS—COMPOUND CHALK POWDER

Composed of chalk, 30 parts; acacia, 20 parts; sugar, 50 parts.

DOSE.—Dogs, 10 gr. to 1 dr.; cats, 1 to 5 gr.

MISTURA CRETAE—CHALK MIXTURE

Composed of compound chalk powder, 20 parts; cinnamon water, 40 parts; water to make 100.

DOSE.—Dogs, 1 to 2 oz.; cats, 1 to 2 dr.

ACTIONS.—Internally, chalk is the slowest acting antacid, because of its comparative insolubility and is of value when it can exert its long-continued influence throughout the digestive tract. It resembles bismuth in mechanically coating or protecting inflamed or irritable surfaces. It is not so astringent nor antiseptic as the bismuth salts, and these are generally preferable to chalk for the smaller animals. It is excreted unchanged in the feces. Externally it is a dessicant and slightly astringent powder, also protective.

USES.—Chalk forms a dusting powder for moist eczema, slight burns and intertrigo; zinc oxide and starch (one to four) is, however, a better preparation. Chalk is the most useful antacid for diarrhoea accompanied by fermentation of the intestinal contents, while its local astringent and protecting influence assists in overcoming the trouble. It is especially good for foals and calves given in flour gruel and often conjoined with catechu, ginger and opium.

Chalk may be given to dogs in pills or powder; to other animals in powder, capsules or electuary. Chalk is frequently prescribed suspended in flour, gruel, milk

or mucilage to the larger animals. The chalk preparations are suitable for dogs and cats.

CUPRI SULPHAS—COPPER SULPHATE—BLUE VITRIOL—BLUE STONE

Derivation.—Boil metallic copper and sulphuric acid together. Dissolve product in hot water and crystallize.

Properties.—Large, transparent, deep blue, triclinic crystals; odorless, of a nauseous, metallic taste; slowly efflorescent in dry air; soluble in water; almost insoluble in alcohol.

Dose.—Horses and cattle, 1 to 2 dr.; sheep and pigs, 20 to 40 gr; dogs, 1 to 2 gr.

As a tonic and astringent, repeat two or three times daily; given either in capsule or in some mucilagenous solution, or in powder form, with some inert substance; when given as a tonic should be given at time of feeding, or right after eating.

Actions. — Gastro-intestinal irritant, astringent, tonic, emetic in large doses; acts directly on the stomach; antiseptic and vermifuge.

Uses.—Internally used as emetic, antidote for phosphorus, atony of the bowels, diarrhoea, especially combined with dilute sulphuric acid opium; is supposed to prevent the development of farcy and glanders in exposed animals. Used externally as a caustic and stimulant; styptic, also used for foot-rot; for granular eyelids, touch lightly over the granular surface with the sulphate of copper.

DIGITALIS—FOXGLOVE

The dried leaves of Digitalis purpurea Linne (Fam. Scrophulariaceae-, collected from plants of the second year's growth, at the commencement of flowering.

Habitat.—Foxglove grows wild in the temperate parts of Europe, where it flowers in the middle of summer. In this country it is cultivated for ornamental and for medical use.

Properties.—Foxglove is without odor in the re-

cent state, but acquires a faint narcotic odor when dried. The color of the dried leaf is a dull pale green, modified by the whitish down upon the under surface; that of the powder is a fine deep green.

CONSTITUENTS. — Digitalein, Digitonin, Digitalin and Digitoxin, the latter is most poisonous and active. Said to be cumulative.

DOSE.—Digitalis leaves, horses, 15 gr. to 1 dr.; cattle, 30 gr to 1½ dr.; sheep and pigs, 5 to 15 gr.; dogs, ½ to 3 gr.

ACTIVE PRINCIPLES.—Digitoxin—It occurs in crystals, soluble in alcohol and chloroform, slightly in ether, and insoluble in water; said to be cumulative.

DOSE.—Horses and cattle, ⅛ to ¼ gr.; dogs, 1/250 to 1/50 gr.

Digitalein, an amorphous, bitter substance, soluble in water and alcohol and non-cumulative.

DOSE.—Same as digitoxin.

Digitalin, a very bitter, crystalline substance, soluble in alcohol, and slightly soluble in water and ether.

DOSE.—Same as for digitoxin.

Digitonin, resembling or identical with saponin of senega. White, amorphous powder, soluble in water. It is a heart depressant, muscular paralyzant and powerful irritant, besides being antagonistic to digitalis. In addition to these principles there are: Digitin, an inactive substance. Digitalic and antirrhinic acids. Tannin coloring matter, starch, sugar, gum, a volatile oil, salts, etc., common to most vegetables.

PREPARATIONS

EXTRACTUM DIGITALIS—EXTRACT OF DIGITALIS

Made by maceration and percolation with alcohol and water; distillation of alcohol and evaporation to pilular substance.

DOSE.—Horses and cattle, 5 to 10 gr.; sheep and pigs, ½ to 2 gr.; dogs, ⅛ to 1 gr.

FLUIDEXTRACTUM DIGITALIS—FLUID EXTRACT OF DIGITALIS

Prepared by maceration and percolation with alcohol and water, and evaporating so that 1 c. c. equals 1 gm. of the crude drug.

Dose.—Horses, 10 m. to 1 dr.; cattle, 30 m. to 1½ dr.; sheep and pigs, 5 to 15 m.; dogs, ½ to 2 m.

TINCTURA DIGITALIS—TINCTURE OF DIGITALIS

Composed of powdered digitalis 100 parts with sufficient alcohol and water to make 1000 parts. By maceration and percolation.

Dose.—Horses and cattle, 2 to 4 dr.; sheep and pigs, ½ to 1 dr.; dogs, 5 to 20 m.

INFUSUM DIGITALIS—INFUSION OF DIGITALIS

Composed of digitalis 15 parts, alcohol 100 parts, cinnamon water 150 parts, boiling water 500 parts, cold water to make 1000 parts. By maceration.

Dose.—Horses and cattle, 2 to 4 oz.; sheep and pigs, ½ to 1 oz.; dogs, 1 to 4 dr.

There are several substitutes for digitalis found in commerce.

Actions.—A cardiac and vascular tonic and stimulant, a motor excitant, paralyzant, anaphrodisiac, it is an indirect diuretic and an emetic, irritates the mucous membrane.

The heart is slowed but the force is increased; digitalis stimulates the cardiac motor ganglia, the inhibitory apparatus and the vaso-motor centers, contracting the arterioles and thereby greatly raising the arterial tension; large doses exhaust and paralyze the heart.

Its diuretic action is very complex, one of the active principles, digitalin, increases the arterial pressure by contracting the blood vessels of the body, while the large renal arteries are dilated by two of its active principles, digitoxin and digitalein. On this account digitalis is an ideal diuretic.

Uses.—It is used as a cardiac stimulant in full doses, followed by small ones; used in heart and cardiac debility from any cause, irregularity of the heart due to debility; used in dropsical conditions, combined with acetate or nitrate of potash; it is useful in congestion of organs, useful in the first stages of pneumonia and scarlatina; as a diuretic over the region of the kidneys this can be used two or three times daily; when internal remedies fail to increase the action of the kidneys this is very effectual. Useful in palpitation of the heart due to overexertion. Digitalis is occasionally employed with good results as a poultice of the leaves, applied over the loins to promote diuresis, or in local inflammation, to contract blood vessels.

FERRUM REDUCTUM—REDUCED IRON

Derivation.—Hydrogen gas is passed over freshly made and carefully washed ferric oxide in a hot and closed tube.

Properties.—A very fine grayish-black, lustreless powder, without odor or taste; permanent in dry air; insoluble in water or alcohol.

Dose.—Horses, 1 to 2 dr.; cattle, 2 to 4 dr.; sheep and pigs, 20 to 30 gr.; dogs, 1 to 5 gr.

FERRI SULPHAS—FERROUS SULPHATE—COPPERAS—GREEN VITRIOL

Derivation.—Iron wire is dissolved by boiling in dilute sulphuric acid.

Properties.—Large, pale bluish-green, monoclinic prisms, without odor and having a saline styptic taste; efflorescent in dry air. On exposure to moist air the crystals rapidly absorb oxygen and become coated with brownish-yellow, basic ferric sulphate; soluble in water, insoluble in alcohol.

Dose.—Same as reduced iron.

FERRI SULPHAS EXSICCATUS—DRIED FERROUS SULPHATE

Derivation.—Allow ferrous sulphate, 100 parts,

to effloresce at a temperature of 104° F., then heat on a water bath until the product weighs 65.

PROPERTIES.—A greyish-white powder, slowly but completely soluble in water, without odor, and having a saline styptic taste.

DOSE.—Same as reduced iron.

FERRI CARBONAS SACCHARATUS—SACCHARATED FERROUS CARBONATE

DERIVATION.—Ferrous sulphate, 50; sodium bicarbonate, 35; sugar and distilled water. Made by solution, precipitation and washing.

PROPERTIES. — Greenish-brown powder, without odor; sweetish taste; becomes oxidized on exposure to the air.

DOSE.—Horses, 2 to 4 dr.; cattle, ½ to 1 oz.; sheep and pigs, ½ to 1 dr.; dogs, 2 to 10 gr.

SYRUPUS FERRI IODIDI—SYRUP OF FERROUS IODIDE

Contains five per cent, by weight, of ferrous iodide.

PROPERTIES.—Transparent, pale green liquid; sweet, ferruginous taste.

DOSE.—Horses, ½ to 1 oz.; cattle, 1 to 2 oz.; sheep and pigs, 1 to 2 dr.; dogs, 5 to 30 m. Given when you want the combined action of iron and iodine.

ACTION.—Tonic, alterative, diuretic and emmenagogue.

FERRI CHLORIDUM—FERRIC CHLORIDE

Ferric chloride should contain not less than 22 per cent of metallic iron in the form of chloride.

PROPERTIES.—It is in orange-yellow, crystalline pieces, odorless or having a faint odor of hydrochloric acid and a strong styptic taste; deliquescent; soluble in water and alcohol; not used internally.

Used almost exclusively in the form of tincture or liquor, and in reference to its effect and application I refer you to Tincture Ferri Chloridi and Liquor Ferri Chloridi

LIQUOR FERRI CHLORIDE—SOLUTION OF FERRI CHLORIDE

DERIVATION.—Dissolve iron wire, 125, in hydrochloric acid, 680, nitric acid and water to make 1000.

PROPERTIES.—A reddish-brown liquid, having a faint odor of hydrochloric acid, an acid, strongly styptic taste.

DOSE.—Horses and cattle, 2 to 4 dr.; sheep and pigs, 10 to 20 m.; dogs, 2 to 10 m. All liquid preparations of iron should be well diluted with water or oil.

TINCTURA FERRI CHLORIDI—TINCTURE OF FERRIC CHLORIDE

Composed of ferric chloride, 350 parts; alcohol to make 1000.

DOSE.—Horses and cattle, 1 to 2 oz.; sheep and pigs, 20 to 30 m.; dogs, 5 to 30 m.

LIQUOR FERRI SUBSULPHATIS—SOLUTION OF FERRIC SUBSULPHATE—MONSEL'S SOLUTION

A solution of sulphate of iron, sulphuric and nitric acids.

PROPERTIES.—A dark reddish-brown liquid, odorless or nearly so; of an acid, strongly styptic taste; miscible in water and alcohol.

DOSE.—Horses and cattle, 2 to 4 dr.; sheep and pigs, 10 to 20 m.; dogs, 2 to 10 m. This is used almost entirely for external use as an astringent and styptic.

There are 36 official preparations of iron and a number of unofficial preparations, quite a few of which are impracticable for use in veterinary medicine, consequently we have considered only those which are practicable for use. Some are more irritating than others and some have special actions due to other drugs combined with the iron.

GENERAL ACTION OF IRON AND ITS SALTS

Iron is not a foreign substance to the organism. It is constantly present in the blood, gastric juice, lymph, bile, pigment of the eye and traces of it in the milk and

urine. In man there is 1 part of iron to 230 red blood corpuscles, and in cattle 1 to 194 red globules. That it performs a very important part is shown in the rapid construction of red globules when iron is administered in anaemia. Without it haematin is not formed and red globules diminish in number. By its medicinal use we furnish to the blood a material which it needs. The action of iron is not limited merely to the construction of red blood. It also promotes the appetite and invigorates the digestion when there is no intolerance to its presence in the stomach. By increasing the disposition for food and the ability to dispose of it, iron acts as a stomachic, consequently when given in the healthy state or when administered for too long a period during disease the gastric glands become exhausted by over-stimulation; then it is said that iron disagrees. Being a restorative its use is contra-indicated in a condition of plethora (fullness of the blood vessels). In large doses the soluble preparations of iron give rise to nausea and vomiting, some of them possessing more or less toxic activity. The iodide chloride and sulphate are the most active. Large doses will produce gangrene of the stomach and intestines. Certain salts of iron, as the sulphates, nitrates and chlorides, possess a high degree of astringency, hence they produce constipation when taken internally. When brought into contact with blood they coagulate it, forming a tough brownish magma, and as the albuminous elements of the tissues are also solidified they are powerful haemostatics. Iron is eliminated chiefly by the intestinal route, partly by the liver into the bile, thence into the intestines, some by the kidneys also. The tincture of the chloride being especially diuretic.

Iron is a haematinic, stomachic, styptic, astringent or haemostatic. The tincture chloride in addition is diuretic. The sulphate is in addition vermicide. The iodide is alterative and resolvent as well as tonic. A medicine used in combination with iron may modify or enhance its action. Externally iron salts contract tissue by co-

agulating albumen when applied to raw surfaces or mucous membranes, and through this means by compressing the blood vessels from without and plugging them from within with clotted blood, arrest hemorrhage. The astringent salts may also induce some contraction of the vessels besides. Iron in the form of liquor ferri chloridi or liquor ferri subsulphatis is the most powerful of the metallic hemostatic agents we possess.

Uses Internally.—The saccharated carbonate is staple, non-irritating to the stomach, and especially suited to dogs. It has the same uses as the sulphate. It is also used for the other animals when the stomach is weak.

Sulphate of iron is used locally as an astringent and internally as a haematinic and tonic in anaemia. It improves the appetite and abates exhausting discharges, as in nasal gleet and leucorrhoea. In atonic torpidity of bowels it is prescribed with aloes; also in the same way for intestinal worms. Conjoined with iodine it is the best prescription for diabetes insipidus. It is also prescribed with good results in the first stages of liver rot in sheep. Chorea and epilepsy when with anaemia are benefited by iron. Combined iron and arsenic for chorea. Septicaemia, pyaemia and all forms of blood poisoning, as purpura, haemorrhagica, scarlatina, etc., with quinine. The tincture chloride is prescribed in blood poisoning. In red water of cattle, after bowels are freely opened. In convalescence from debilitating diseases it is a valuable tonic combined with other medicines as nux vomica, quinine, etc. Such diseases as influenza, chest diseases and chronic catarrh should be followed with iron and other tonics.

Iodide of iron is used when an alterative as well as a tonic action is desired. It is given to promote the absorption of glandular enlargements in young and weakly animals, and in swelling of the joints. It is useful in polyuria or diabetes insipidus, also nasal gleet.

Tincture chloride of iron acts as a haematinic, tonic, antiseptic, astringent, styptic, diuretic and local irritant

or caustic. It is serviceable in most cases in which the sulphate is recommended. It is used in atonic dyspepsia and for the removal of intestinal worms, in relaxed and sore throat.

Tincture Chloride of iron is also used in anaemia combined with arsenic or quinine, and in blood poisoning combined with quinine. It also promotes absorption of inflammatory material when associated with debility and anaemia. It is the most serviceable preparation of iron for influenza, purpura and scarlatina, as it has a tonic effect on both the blood and arterioles. In these cases it is prescribed with turpentine, quinine and oil. It is used in rheumatism in weakly patients alternated with salol, salicylic acid or salicylate of soda. Also used as an astringent and stimulant for the genito-urinary mucous membrane. The tincture being excreted by the kidneys, is preferred to watery solution. It is particularly suited for distemper and rheumatic lameness in weakly dogs.

Uses.—Externally: Liquor ferri chloridi and liquor ferri subsulphatis are sometimes used to stop bleeding from wounds or natural cavities of the body. They may be injected, applied by swab, or on absorbent material, which is packed into the wound or cavity. As a local application in pharyngitis, we use one part of the solution of ferric chloride with four parts of glycerine. In the same strength, diluted with water, the chloride may be injected into the uterus to stop hemorrhage. Again, a solution in the strength of two drachms to the pint of water, is employed as an enema to destroy ascarides. The objection to these solutions of iron is that they form heavy, nasty, tenacious clots when employed to arrest hemorrhage, and the clots are apt to decompose and favor sepsis. Therefore they should not be used if other means, as ligature, pressure, heat or cold can be utilized. Iron is regarded as a specific for erysipelas. It is given both internally and externally.

Administration of Iron.—The fluid preparations should be freely diluted; the solid preparations should

be combined with protectives or inert remedies, either in powder or capsule form, or with stomachics as gentian root. Iron causes less gastric irritation and enters the blood more readily if given with or immediately after meals. In anaemia it should be given in increased doses. Overcome constipation by giving when necessary or combining iron with laxatives as linseed oil.

GAMBIR—CATECHU

An extract prepared from the leaves and twigs of Ourouparia Gambir (Hunter), Ballon (Fam. Rubiaceae). U. S. "An extract of the leaves and young shoots of the Uncaria Gembier, Roxb."

Habitat.—Africa and Southern Asia.

Description.—Irregular masses or cubes; reddish-brown, pale brownish-gray or light brown; fracture dull-earthy; friable, crystalline; inodorous, bitterish, very astringent, with a sweetish after-taste; free from starch. Not less than 70 per cent should be soluble in alcohol.

Constituents.—Catechutannic acid (about 45 per cent) is the active principle; it is converted into the isomeric inactive catchnic acid, or catchin, by the saliva and by boiling, a red color being developed. There is also pyrocatechin or catechol.

Incompatibles.—Alkalies, metallic salts and gelatine.

Dose.—Horses, ½ to 1 oz.; cattle, 1 to 2 oz.; sheep and pigs, 1 to 2 dr.; dogs, 5 to 30 gr.

PREPARATIONS

TINCTURA GAMBIR COMPOSITA—COMPOUND TINCTURE OF GAMBIR

Composed of gambir, 50; cinnamon, 25; alcohol to make 1000.

Dose.—Horses, ½ to 2 oz.; cattle, 1 to 3 oz.; sheep and pigs, ½ to 1 oz.; calves and foals, ½ to 1 oz.; lambs, 10 to 30 m.; dogs, ½ to 1 dr. The above doses can be considerably increased and are good in cases of diarrhoea of small and young animals.

Action and Uses.—Gambir is administered to all

classes of domestic animals for the arrest of chronic catarral discharges and haemorrhage, especially from the alimentary canal. The insoluble catechnic acid beneficially exerts its astringency on the relaxed, over-secreting surfaces alike of small and large intestines. In chronic diarrhoea and in dysentery it is combined with aromatics to allay flatulence; with opium to relieve irritability and spasm; with alkalies, magnesia, or chalk to counteract acidity.

If there is much mucus in the fecal discharges, showing a catarrhal state of the intestinal mucous membrane, it is advisable to give oil, salts or calomel before checking up the bowels with an astringent.

GENTIANA—GENTIAN

Gentian is obtained from the root Gentiana lutae.

HABITAT.—Mountainous parts of Southern and Central Europe.

PROPERTIES.—Odor strong, characteristic; taste slightly sweetish, strongly and persistently bitter. The powder is free from starch grains and sclerenchymatic tissues.

DOSE.—Horses, ½ to 1 oz.; cattle, 1 to 2 oz.; sheep and pigs, 1 to 2 dr.; dogs, 5 to 30 gr.

PREPARATIONS

EXTRACTUM GENTIANAE—EXTRACT OF GENTIAN

Made by maceration and percolation with water and evaporated.

DOSE.—Horses, 30 gr. to 1 dr.; cattle, 1 to 2 dr.; sheep and pigs, 20 to 40 gr.; dogs, 1 to 3 gr.

FLUIDEXTRACTUM OF GENTIANAE—FLUIDEXTRACT OF GENTIAN

Made by maceration and percolation with dilute alcohol and evaporated, so that 1 c. c. equals 1 gm. of the crude drug.

DOSE.—Horses, ½ to 1 oz.; cattle, 1 to 2 oz.; sheep and pigs, 1 to 2 dr.; dogs, 5 to 30 m.

TINCTURA GENTIANAE COMPOSITA—COMPOUND TINCTURE OF GENTIAN

Composed of gentian, 100 parts; bitter orange peel, 40 parts; cardamon, 10 parts; made by maceration and percolation with alcohol and water.

Dose.—Horses and cattle, 1 to 4 oz.; sheep and pigs, 2 dr. to 1 oz.; dogs, ½ to 1 dr.

Action and Uses.—Gentian is a pure bitter, and is prescribed as a stomachic and tonic for all classes of animals. Gentian improves the appetite and general tone. In atonic indigestion it is particularly useful amongst young animals, and in such cases is often conjoined with ginger and sodium bicarbonate. In relaxed and irritable states of the bowels and where intestinal worms are suspected, after administeration of a laxative, gentian and dilute hydrochloric acid are of service. For horses suffering from simple catarrh few combinations are more effectual than an ounce of powdered gentian, two drachms potassium nitrate with two ounces of magnesium sulphate, dissolved in a pint of linseed tea, repeated morning and night. Where more general tonic effects are sought, iron sulphate is alternated with the gentian and salines. Gentian proves an excellent stomachic and stimulating tonic in influenza and other epizootics, helps convalescence from exhausting disorders and is a useful restorative for horses, overworked or suffering from loss of appetite or slight cold. The powdered gentian should be added to aloes when given in full cathartic doses to horses.

HYDRARGYRI CHLORIDUM CORROSIVUM—CORROSIVE MERCURIC CHLORIDE—BICHLORIDE OF MERCURY—CORROSIVE SUBLIMATE

Origin.—Bichloride of mercury is obtained as a sulphate by heating a mixture of mercuric sulphate, sodium chloride and a little black oxide of manganese.

Properties.—Heavy, colorless masses; soluble one

in sixteen of water, one in three of alcohol; hydrochloric acid or muriate of ammonia increases its solubility.

Actions.—It is a corrosive, irritant poison; it is occasionally prescribed as an alterative, antiseptic and hepatic stimulant; repeated doses or long continued produce mercurialism. Externally, it is used as an antiseptic, astringent, caustic and parasiticide. It is a most powerful antiseptic when five parts of tartaric acid are added to one part of bichloride of mercury, which prevents the formation of insoluble albumenates of mercury in the tissues which checks any further action of the drug. Hydrochloric acid equal parts serves the same purpose.

Uses.—For internal use milder preparations of mercury are preferred, and it is dangerous to use it for the production of mercurialism. For horses it has been prescribed in tetanus, chronic skin eruptions and swollen oedematous legs following repeated attacks of lymphangitis. Its chief use is that of an antiseptic externally for many surgical purposes, usually in the strength of one to five hundred, one to one thousand; for uterine injections, one to five thousand or one in ten thousand. Seven and a half grains to a pint of water makes a one to one thousand solution. Seven and a half grains to a quart of water makes a one to two thousand solution. Fifteen grains to a pint of water makes a one to five hundred solution. Instruments, sponges, towels as well as the hands are disinfected by washing in a one thousandth solution. But it is injurious to most metal instruments and irritates and roughens the operator's hands. Best antiseptic for foul wounds, thrush, poll-evil, quittor and fistulous withers and nail punctures of the feet, a one in five hundred to one in one thousand solution to destroy the cryptogamic growths of ringworm, to kill lice and allay the itching of puritis and urticaria. Bichloride of mercury one part in one or two thousand parts of water is injected into the uterus in metritis, and in cases of abortion with good results. Contageous abortion is satisfactorily prevented by washing the aborted animal's

tail and external genital organs twice daily. All pregnant cows should be treated in the same manner. Warm solutions are much more active than cold.

A one in three to five thousand solutions are used in purulent conjunctivitis or wounds of the eye and lids, by frequently saturating absorbent cotton in the solution and holding over the eye by means of a clean cloth or bandage.

Doses.—Horse, 1 to 5 gr.; cattle, 2 to 8 gr.; sheep, ½ to 1 gr.; pigs, ⅛ to ½ gr.; dogs, 1/60 to 1/10 gr. Not often given internally. It is the best of all the preparations of mercury for hypodermic use in syphilitic diseases.

Antidotes.—The white of eggs, stomach pump for horses and emisis for dogs; wheat flower, milk, etc.

HYDRARGYRI CHLORIDUM MITE—MILD MERCUROUS CHLORIDE—CALOMEL

Origin.—Calomel is obtained by heating a mixture of mercurous sulphate and sodium chlorid. Calomel is found native in Spain and Carniola, but in too small quantities for commercial value.

Properties.—Calomel is a dull-white heavy powder. It is inodorous, insoluble in water, alcohol or ether.

Actions.—Calomel is a cathartic, laxative, alterative, diuretic and vermifuge. Small doses are laxatives when repeated, large doses are cathartics, full doses irritate the stomach and produce emesis in man and dog. By stimulating the urea functions of the liver diuresis are produced, its action on the liver does not directly increase the secretion of bile, but removes it from the duodenum which reflexly increases its secretion. Repeated doses produce mercurial poisoning. It is an alterative when combined with opium, laxative in small repeated doses and cathartic in larger doses.

Uses.—Calomel is useful in gastric and intestinal catarrh, bilious diarrhoea, influenza lymphangitis and liver disorders which show themselves by a yellowness of the visible mucous membranes. It is a useful adjuvant cathartic conjoined with aloes or other cathartics.

As a laxative or cathartic for horses give aloes and calomel; cattle and sheep, magnesium and sodium sulphate; for pigs, dogs and cats with jalap. Pure calomel is a specific for thrush. It is also useful in the treatment of moist skin and raw sores, mixed in equal parts with bismuth subnitrate it quickly dries the flesh and prevents itching.

Doses.—As a laxative vermifuge and alterative horses and cattle take 20 to 40 grs.; sheep and pigs, 5 to 20 grs.; dogs and cats, 1/16 to 1 gr., given two or three times a day with equal weight of opium which prevents griping and a too rapid removal by the bowels. As a cathartic, calomel is best conjoined with other medicines regulated by that of the medicine with which it is conjoined. A full cathartic for horses should consist of calomel 1 to 1½ drs. with aloes 4 to 6 drs.; cattle, 1½ to 2 drs. with magnesium sulphate or sodium sulphate 1 to 1½ pounds; sheep, 5 to 30 grs. with magnesium sulphate 4 to 8 ounces; pigs, 5 to 30 grs. with sodium bicarbonate ½ to 1 ounce; dogs and cats ⅛ to 10 grs. with jalap 10 to 30 grains.

HYDRARGYRI IODIDUM RUBRUM — RED IODIDE OF MERCURY—BINIODIDE OF MERCURY

Origin.—Red iodide of mercury is obtained by dissolving in water separately bichloride of mercury and potassium iodide, and pour both solutions slowly and stirring actively.

Properties.—A scarlet-red, amarphous powder; odorless and tastless; permanent in air, insoluble in water; soluble in one hundred and twenty-five parts of alcohol.

Actions.—Red iodide of mercury is a stimulant irritant, resolvent pustulant antiseptic and parasiticide.

Uses.—Mixed with one to eight parts of lard it is a blister used to reduce bony enlargements or bone-tumors as in splints, bone spavin, ringbone, sidebone and actinomycosis; it is also used with good results in reducing soft swellings, to arrest chronic inflammation

and promote absorption of inflammatory deposits, as seen in sprained tendons, curbs, enlarged joints, bursae, etc. It is frequently used as a counter-irritant in sore throat, chronic cough and roaring. Mixed with cantharides the strength can be reduced as an irritant and less apt to permanently destroy the hair bulbs. It is used internally to arrest the growths of actinomycoses and scirrhous cord, but in those cases the benefits are derived from the potassium iodide which it contains, and I would recommend administering internally without the mercury.

HYDRARGYRI OXIDUM FLAVUM—YELLOW MERCURIC OXIDE

Origin.—Yellow mercuric oxide is obtained by the interaction of mercuric choride and sodium hydroxide.

Properties.—Mercuric oxide is of a yellow color, similar to that of the yolk of egg, and is a completely amorphous powder; odorless, and having a somewhat metallic taste; permanent in the air, but turning dark on exposure to light; insoluble in water or alcohol.

Actions.—A stimulant caustic and anesthetic.

Uses.—The official ointment of yellow mercuric oxide is prescribed as a stimulant and anesthetic in chronic inflammation and ulceration of the eye (4 gr. of yellow mercuric oxide to 1 oz. of vaseline). It is also employed on skin diseases, indolent ulcers, swollen glands and granulated wounds.

HYDRASTIC—GOLDEN ZEAL

The rhizome and roots of hydrastic canadensis Linne, yielding not less than 2.5 per cent of hydrastine.

Habitat.—North America in woods west to Missouri and Arkansas.

Properties.—Externally brownish-gray to yellow-brown; fracture short, wood wedges bright yellow, pith large, light yellow, the roots thin, brittle, with a thick yellow bark and a somewhat quadrangular wood; odor distinct; taste bitter.

CONSTITUENTS.—Berberine, an alkaloid occurring in yellow crystals, hydrastine a colorless; crystalline alkaloid, soluble in alcohol and ether; canadine occurring in white, acicular crystals.

DOSE.—Horses and cattle, 2 dr. to 1 oz.; sheep and pigs, 1 to 2 dr.; dogs, 5 gr. to 1 dr.

PREPARATIONS

FLUIDEXTRACTUM HYDRASTIS—FLUIDEXTRACT OF HYDRASTIS

Made by maceration and percolation with alcohol, glycerin and water and evaporation.

DOSE.—Horses and cattle, 3 drs. to 1 oz.; sheep and pigs, 1 to 2 drs.; dogs, 5 gr. to 1 dr.

TINCTURA HYDRASTIS—TINCTURE OF HYDRASTIS

Made by maceration and percolation of hydrastic, with diluted alcohol.

DOSE.—Horses and cattle, 1 to 2 oz.; sheep and pigs, 2 to 4 drs.; dogs, ½ to 2 dr s.

GLYCERITUM HYDRASTIS—GLYCERITE OF HYDRASTIS

Made by maceration and percolation of hydrastis, 1000 parts add water to the percolate and evaporate. Add water to the residue, set aside 24 hours and filter; add enough water to the filtrate to make 500 parts; then add glycerin 500.

DOSE.—Horses and cattle, 2 drs. to 1 oz.; sheep and pigs, 1 to 2 drs.; dogs, 5 m. to 1 dr.

HYDRASTINNAE HYDROCHLORIDUM—HYDRASTINE HYDROCHLORIDE

The hydrochloride of an artificial alkaloid derived from hydrastine.

PROPERTIES.—Light, yellow, amorphous granules, or a pale yellow crystalline powder; odorless and having a bitter, saline taste; deliquescent on exposure to damp air. Very soluble in cold and hot water and in alcohol.

DOSE.—Horses and cattle, 2 to 6 grs.; sheep and pigs, ½ to 1½ grs.; dogs, 1/12 to ¼ gr.

ACTION AND USES.—It acts like the simple bitters, promotes appetite and aids digestion, increases nutrition and stimulates secretion, especially of the intestines and liver. It is a stomach tonic, laxative, slightly diuretic and hepatic stimulant. It is also said to promote uterine constructions, and has some power as an antispasmodic. Externally it is an antiseptic and astringent. Useful in conjunctivitis, nasal gleet and leucorrhoea; one to two drachms of the fluid extract or glycerite to the ounce of distilled water. One to two drachms of the fluidextract of hydrastis to one ounce of water is useful as a gargle for sore throat. Equal parts of fluidextract of ergot and fluidextract of hydrastis is useful in ulceration of the uterus, vagina and in eversion of the rectum. Useful internally during convalescence after debilitating diseases, as in influenza and distemper, or whenever a bitter tonic is indicated, as in dyspepsia, chronic gastric catarrh, catarrhal jaundice, constipation from chronic nephritis and chronic cystitis. The glycerite applied locally for fissure of teats, cracked heels. Where there is a tendency to constipation it should be used as a bitter in preference to gentian, etc.

IODUM—IODINE

DERIVATION.—Iodine exists in certain marine vegetables, particularly the fuci or common sea weeds, which have long been its most abundant natural source. Iodine is also found in the animal kingdom, as in the sponge, oysters, cod liver oil and eggs, and in the mineral kingdom, in sea water in small quantities, in certain salt springs. It is obtained commercially from one of these sources.

PROPERTIES.—Iodine is heavy, bluish-black color, dry and friable, rhombic plates, having a metallic luster, a distinctive odor, and a sharp and acrid taste. Iodine imparts a deep brown, evanescent stain to the skin, and slowly destroys vegetable colors. Soluble in about 5000 parts of water and in 10 parts of alcohol

at 77° F., freely soluble in ether, chloroform or carbon disulphide; its solution in alcohol or in an aqueous solution of potassium iodide has a reddish color; its solution in chloroform or carbon disulphide has a violet color.

Actions.—Iodine internally is an antiseptic, alterative, resolvent and irritant. Full doses persisted will produce a state of debility and emaciation termed iodism. Externally it is applied as an antiseptic, disinfectant, parasitide, deodorant, stimulant, disquamatic, absorbent and counter-irritant. Iodine is one of the best antiseptics for surgical purposes. The tincture iodine especially kills all disease producing bacteria in one minute, whereas it takes a one in one thousandth solution of bichloride of mercury more than half an hour to destroy the same micro-organisms. The tincture of iodine also possesses unusual penetrating power on the dry skin, finding its way into the hair follicles and cutaneous glands. Iodine must not be applied to the wetted skin because the wetting causes the skin cells to swell and thus prevent the iodine from penetrating into the sebaceous and sudoriparous glands, the very action upon which the special germicidal action depends.

Uses.—Iodine is of most value applied externally, or locally. In sterilizing the skin for an emergency operation the hair should be clipped and shaved dry and the tincture of iodine applied without washing the skin. For other operations the skin may be scrubbed with soap and shaved and dried before applying the tincture. The tincture should always dry on the skin before the operation is begun.

The method used in human surgery for sterilizing the skin, and recommended by leading surgeons, consists in first of cleansing the skin with gasoline to remove the grease and then applying the tincture of iodine in full or half strength.

Tincture of iodine applied is of some value in the treatment of periostitis with osseous deposits, as splints, bone-spavin, ringbone, sidebones, etc. It is used for enlargements of glands as goiter in dog.

LINUM—LINSEED—FLAXSEED

Ground linseed (linseed meal or flaxseed meal) should be recently prepared and free from unpleasant or rancid odor. It is a grayish-yellow powder containing brownish fragments.

Action and Uses.—It is nutrient, tonic, laxative, emollient and demulcent. Linseed meal and the cake are valuable foodstuffs in small quantities. It is two and one-half times as fattening as starch or sugar. It causes the hair of an animal to become slick and glossy and induces shedding in the spring, but is very heating in summer. Linseed gruel is a food, being palatable and easily digested, for horses, cattle and sheep, not only good in health, but in debilitating diseases, also in chronic skin diseases. It acts in such cases both as food and medicine. In febrile diseases horses will often sip or drink cold linseed tea (linseed meal two ounces to one pint of water) when they will not touch anything else. When a patient is exhausted the linseed tea is given with milk, eggs and whisky. Horses that are poor feeders, having harsh scurvy skins, or being affected with roaring, thick wind or heaves, are usually much benefited with linseed in some form. A mucilaginous demulcent in the proportion of about one to two ounces to a pint of warm water, is useful in irritable conditions of the throat, alimentary canal, kidneys and bladder.

For linseed poultices, take the best grade of linseed meal, pour hot water over it until it becomes pasty. Charcoal and antiseptics are often mixed with it. When used as a poultice on the foot in nail pricks, always put on a poultice that will cover the whole foot.

OLEUM LINI—LINSEED OIL—OIL OF FLAXSEED

A fixed oil expressed from flaxseed without the use of heat.

Properties.—A yellowish or yellow, oily liquid, having a slight, peculiar odor and bland taste. Soluble in

about ten parts of absolute alcohol and in all proportions in ether, chloroform, benzine or oil of turpentine.

Linseed oil for medicine should always be used raw.

Dose.—Horses, 1 to 2 pints; cattle, 2 to 4 pints; sheep and pigs, 5 to 10 ozs.; dogs, ½ to 3 ozs.; cats, ½ to 1 dr.

Action and Uses.—Linseed oil cannot be used as a diet on account of its being too laxative; it is laxative in small doses, but in large doses produces copious discharges of faeces, having a distinct linseed oil smell. The oil is also emollient, soothing and softening to inflamed and indurated surfaces. As a laxative it usually produces tolerably full and softened evacuations, without nausea, griping or superpurgation and with decided odor of oil. It is the best physic to administer to pregnant animals and in irritable conditions of the bowels; also in cases of influenza, purpura and other debilitating diseases, where the usual purgatives would be too severe, irritating and exhausting. It is also used as an enema; two to four ounces of the oil or meal given daily in mash often suffices to maintain the bowels in a relaxed condition throughout febrile attacks, where there is a tendency to constipation. An ounce or two of oil given daily often relieves broken wind in horses. For burns and scalds the well known *carron oil,* composed of equal parts of linseed oil and lime water, cannot be surpassed. This oil is also used as a vehicle for acrid medicines and to act as a protective to the alimentary tract in poisoning of corrosive medicines, also to sweep them out. Carron oil in two to four ounce doses two to three times daily will often relieve "heaves" in horses.

Linseed oil is frequently given to ruminants, although Epsom salts is generally the best purge for them. It is indicated for these animals when a milder operation than that obtained by a full dose of salts is required, and for its demulcent action in irritable states of the digestive organs.

MAGNESII SULPHAS—MAGNESIUM SULPHATE—EPSOM SALTS

Derivation.—Magnesium sulphate is a constituent of sea water and of some saline springs. It also occurs native, either crystallized in slender, prismatic, adhering crystals, or as an efflorescence on certain rocks and soils which contain magnesia and a sulphate or sulphide. In the United States it is found in the great caves so numerous to the west of the Alleghany Mountains.

Properties.—Small, colorless, rhombic prisms, or acicular crystals, without color and having a cooling, saline and bitter taste; slowly efflorescent in dry air; .85 part of water; insoluble in alcohol.

Actions.—Magnesium sulphate is a hydragogue and cholagogue cathartic; alterative and febrifuge and is also feebly diuretic and diaphoretic. As a cathartic it resembles common and glauber salts, and is more active than potassium bitartrate or sodium phosphate. When magnesium sulphate is administered it causes outpouring of secretion from the walls of the small intestines, most quickly and abundantly when the bowels have been partially emptied by several hours' fasting. Neither pancreatic fluid nor bile is materially increased. But magnesium sulphate has a low diffusing power. It is slowly absorbed, and moreover, retards diffusion and absorption of fluid present in the bowels. In this twofold action by increased secretion and retarded absorption the fluid contents of the bowels are increased, producing more or less mechanical distension and provoking, like other salines, slight peristalsis. The retarded removal of accumulating liquid is apt to produce the formation of gases in the bowels, which is relieved by conjoining carminatives, as ginger or capsicum, while effectual removal of the intestinal fluids is attained by using with magnesium sulphate aloes, calomel or oil. It acts in from twelve to sixteen hours; in small doses it stimulates the secretions of the kidneys and skin. In febrile diseases it is used in small repeated doses. It is valuable in treating animals suffering from reflex skin

irritation, combined with large doses of bicarbonate of sodium, generally gives relief, especially in urtecaria of the horse. It is quite commonly used as a cathartic for horses, but most often for cattle and sheep.

Doses.—When repeated two or three times as a laxative and alterative horses take 2 to 4 ounces, cattle 3 to 6 ounces, sheep and pigs, 1 to 2 drachms. As a cathartic cattle take 1 to 2 pounds, calves two to three months old 3 to 4 ounces, sheep 4 to 6 ounces, dogs 1 to 4 drachms. Aloes is a much better cathartic for horses, and castor or linseed oil acts much better as a cathartic in pigs.

NAPHTHALENUM—NAPHTHALENE

A by-product of gas manufacture.

Properties.—Colorless, shining rhombic crystals of an aromatic acrid taste, insoluble in water but soluble in alcohol, ether and oils.

Dose.—Horses, 1 to 3 dr.; cattle, 2 to 4 dr.; sheep and pigs, 5 to 15 gr.; dogs, 1 to 10 gr. These doses can be doubled in severe cases of intestinal flatulence.

Actions and Uses.—A true intestinal antiseptic and antiferment, is also expectorant, antiseptic and parasiticide. Used in intestinal flatulence, dissolved in tincture capsicum; in diarrhoea and dysentery, is of great value in these ailments, quickly allays foul odor of the evacuations of the bowels; large doses irritate the kidneys and cause bloody urine which ceases upon withholding the drug. When powdered on a wound as wire cuts, etc., will keep away flies and other insects, besides it is a powerful antiseptic and promotes the healing of wounds. Used as an ointment it is very effective in parasitic skin diseases.

NUX VOMICA—QUAKER BUTTON

The dried ripe seeds of Strychnos nux vomica, yielding when assayed by the process given below, not less than 1.25 per cent of strychnine.

Habitat.—The tree is a native of the East Indies, growing in Bengal, Malabar, on the Commandel Coast,

in Ceylon, in many islands of the Indian Archipelago, in Cochin-China and in other neighboring countries.

DESCRIPTION.—Orbicular, nearly flat, sometimes irregularly bent, about three-quarters of an inch in diameter and two in thickness; externally grayish or greenish-gray, the surface covered with short closely oppressed, satiny hairs; rounded or somewhat acute at the margin, with a slight ridge extending from the center of one side to the edge; internally whitish-gray, horny, very tough, the endosperm in two more or less regular concavo-convex halves, between which, at one end, lie the heart-shaped, palmately nerved cotyledons; inodorous; taste intensely and persistently bitter.

CONSTITUENTS. — Two alkaloids. 1. Strychnine, 0.2—0.6 per cent. 2. Brucine, 0.5—1.0 per cent. Similar in action to strychnine, but weaker and slower. Both alkaloids exist in combination with igasuric acid. Brucine occurs in rectangular octohedral crystals; it is soluble in alcohol, in 7 parts of chloroform, and possesses a bitter taste. With sulphuric and nitric acids a beautiful blood-red color is developed. There are also: 4. Igasuric acid with which strychnine and brucine are combined. 5. Loganin, an inert glucoside occurring in colorless prisms.

DOSE.—Of the ground seeds, horses and cattle, 1 to 2 dr.; sheep, 20 to 40 gr.; pigs, 10 to 20 gr.; dogs, 1 to 2 gr.

PREPARATIONS

EXTRACTUM NUCIS VOMICAE—EXTRACT OF NUX VOMICA

Made by maceration with alcohol, water and acetic acid; percolation with alcohol and water and evaporation. Standardized to contain 5 per cent of strychnine.

DOSE.—Horses and cattle, 5 to 15 gr.; sheep, 2 to 5 gr.; pigs, 1 to 2 gr.; dogs, $\frac{1}{8}$ to $\frac{1}{4}$ gr.

FLUIDEXTRACTUM NUCIS VOMICAE—FLUIDEXTRACT OF NUX VOMICA

Made by digestion and percolation with alcohol and water and acetic acid. The alcohol is distilled off and

the solution evaporated. Alcohol and water are added so that the fluid extract shall contain one per cent of strychnine.

Dose.—Horses and cattle, 1 to 2 dr.; sheep, 20 to 30 m.; pigs, 10 to 20 m.; dogs, 1 to 2 m.

TINCTURA NUCIS VOMICAE—TINCTURE OF NUX VOMICA

Made by solution of the extract of nux vomica, 20 in alcohol, and water to make 1000. Standardized to contain 0.1 per cent strychnine.

STRYCHNINA—STRYCHNINE

An alkaloid obtained from nux vomica, and also obtainable from other plants of the natural order Loganiaceae.

Derivation.—Nux vomica seeds are powdered and strychnine is extracted with water acidulated with hydrochloric acid. The solution is concentrated and strychnine precipitated with lime. It is then redissolved in boiling alcohol and the crystals are deposited upon concentration of the solution.

Properties.—Colorless, transparent, prismatic crystals, or a white crystalline powder; odorless, having an intensely bitter taste, preceptible even in solutions of 1 in 700,000. Strychnine should be tasted with extreme caution. Permanent in the air, soluble in water, alcohol, ether, chloroform, benzine and anyl alcohol.

Dose.—Same as strychnine sulphate.

STRYCHNINAE SULPHAS—STRYCHNINE SULPHATE

Made by the action of sulphuric acid on strychnine.

Properties.—Colorless or white, prismatic crystals, odorless and having an intensely bitter taste. Efflorescent in dry air. Soluble in water and alcohol. Almost soluble in ether.

Dose.—Horses, ½ to 1½ gr.; cattle, 1 to 3 gr.; sheep, ¼ to ½ gr.; dogs, 1/120 to 1/40 gr. The small doses are to be used when strychnine is given subcutaneously.

ACTIONS.—Nerve tonic, stomach tonic, stimulates respiration, secretion, appetite and digestion; it increases peristalsis, stimulates both the motor and inhibitory apparatus of the heart, and raises arterial tension by stimulating the vaso-motor centers, thus contracting the arterioles, though full doses relax the arterioles and thus lower blood pressure.

Strychnine exalts all functions of the spinal cord, reflex, motor, vaso-motor and sensory, the latter being the least affected; it does not affect the brain directly.

TOXICOLOGY.—Large doses cause trembling and twitching of the voluntary and involuntary muscles with violent clonic spasms, lasting one or two minutes, gradually getting more frequent and severe in form involving the glottis, diaphragm and other muscles of respiration; causes death usually from asphyxia. Very large doses may paralyze the cord as from a blow, and cause almost instant death.

USES.—Nux vomica or strychnine is indicated in any condition in which there is a paralysis or depressed state of the nerves or nervous system; atonic dyspepsia, broken wind, relaxed condition of the bowels due to lack of tone, in small doses.

In weak condition of the heart give with small doses of digitalis; it stimulates sexual organs. Give it in convalescence from debilitating diseases, also as an aid to recovery during their progress; in collapse and for narcotic poisoning strychnine hypodermically in paralysis, whether of limbs, intestines or bladder.

In diarrhoea, due to lack of tone of muscular coat of the bowels combined with astringents; for anaemia, strychnine combined with iron and quinine; nervous coughs use strychnine with sedatives; also in incontinuence of urine and chorea, in dogs after distemper.

ANTIDOTE FOR STRYCHNINE POISONING.—Tannic acid or vegetables containing it should be freely administered, for the tannate of strychnine which is formed is very insoluble; an emetic or the stomach pump must be used promptly. The tetanic spasms are best controlled

by chloral hydrate or very large doses of potassium bromide (2 dr. to ½ oz. for man) or 4 to 8 ounces for the horse as antidote for strychnine poisoning. Inhalations of ether are also recommended. Chloral hydrate may be used per rectum or intravenously. Inhalations of amyl nitrate are also of value. The administration of melted lard seems to exert peculiar antidotal properties to strychnine poisoning. As an emetic for dogs apomorphinae hydrochloras 1/20 to 1/5 grain, given hypodermically, is the best and may have to be pushed as emetics act tardily in poisoning by this drug.

OLEUM MORRHUAE—COD LIVER OIL

A fixed oil obtained from the fresh livers of cod fish.

Habitat.—North Atlantic Ocean.

Properties.—A pale yellow, thin, oily liquid, having a peculiar slightly fishy but not rancid odor, and a bland, slightly fishy taste. Cod liver oil is often adulterated with the oil of other fish. Brown oils are not desirable therapeutically.

Dose.—Horses, 2 oz.; cattle, 2 to 4 oz.; sheep, 1 oz.; pigs, ½ to 1 oz.; dogs, 1 to 4 dr.; cats, ½ to 1 dr.

Action and Uses.—Nutrient, tonic and alterative; on account of its biliary constituents is easily emulsified and digested. It is indicated in all cases of malnutritious and where the digestive organs are weak; also in animals recovering from debilitating diseases, such as distemper and influenza. It is good in catarrh and bronchitis, as it appears to furnish suitable material for repair of the inflamed mucous membranes. Like other oils it relieves broken wind and is given to man in consumption. It is particularly used for the smaller animals. It is given to dogs and cats during distemper, also in eczema, epilepsy, chorea, rickets and chronic rheumatism.

OLEUM OLIVAE—OLIVE OIL—SWEET OIL

A fixed oil expressed from the ripe fruit of Olea europoea Linne. It should be kept in well stoppered bottles in a cool place.

HABITAT.—Southern Europe and Asia.

PROPERTIES.—A pale yellow, or light greenish-yellow, oily liquid, having a slightly peculiar odor and a nutty oleaginous taste, with a faintly arcid after-taste. Very sparingly soluble in alcohol, but readily soluble in ether and chloroform.

DOSE.—As a laxative—Horses and cattle, 1 to 2 pt.; dogs, 2 to 4 oz.

OLEUM GOSSYPII SEMINIS—COTTON SEED OIL

A fixed oil expressed from the seeds of Gossypium herbaceum Linne and of other species of Gossypium and subsequently purified.

HABITAT.—Southern United States and other semi-tropical countries; cultivated.

PROPERTIES.—A pale yellow, oily liquid, without odor and having a bland nut-like taste. Very sparingly soluble in alcohol, but readily soluble in ether, chloroform or carbon disulphide.

DOSE.—Same as olive oil.

ACTION AND USES.—Both olive and cotton seed oil are laxative tonics, demulcents and emollients. Sweet oil, not used internally to any extent, but is used externally for soothing and healing irritated wounds. It may be used in its pure state or be mixed with carbolic acid, 20 m. of the carbolic acid to 4 oz. of sweet oil.

OLEUM RICINI—CASTOR OIL

DERIVATION.—Castor oil is expressed from the seeds of a plant (Ricinus communis) which grows in the East Indies and Africa in the character of a tree and rises sometimes thirty or forty feet. It also grows in the temperate latitudes of North America and Europe.

PROPERTIES.—Pure castor oil is a thick, viscid, colorless liquid, with little or no odor and a mild though somewhat nauseous taste.

ACTION AND USES.—Good castor oil is a mild and speedy cathartic, usually operating within four to five hours with little griping or uneasiness, and evacuating

the contents of the bowels without much increasing the alvein secretions. Hence it is particularly applicable to constipation from collections of abnormally hard faeces, and to cases in which irritating substances have been swallowed or irritating substances have accumulated in the bowels. From its mildness it is also especially adapted to diseases of the bowels, as colic, indigestion, diarrhoea, dysentery and enteritis. It is also indicated in overloaded bowels in pregnancy combined with anodynes and antispasmodics to prevent griping. Castor oil in two or three ounce doses conjoined with gruel and five or six drops of oil of peppermint is suitable for foals and calves affected with gastro-intestinal disorders. Castor oil is specially applicable in canine practice, to evacuate the bowels, and in irritated conditions of the digestive tract, in ounce doses mixed with equal parts of glycerine and adding two or three drops of oil of wintergreen.

Castor oil may be given to horses in sixteen ounce doses conjoined with oil of peppermint, twenty drops, or tincture opium, one ounce and fluidextract of belladonna, one to two drachms, flour gruel, etc.

Castor oil in one to two drachm doses is especially valuable for poultry.

Castor oil is used with equal success in the treatment of gastro-intestional disorders of cattle, sheep and pigs.

Dose.—Horses and cattle, 12 to 16 oz.; sheep and pigs, 2 to 6 oz.; dogs and cats, ½ to 2 oz.; poultry, ½ to 2 dr.

OLEUM TEREBINTHINAE—OIL OF TURPENTINE

Erroneously Called Spirits of Turpentine

Derivation.—A concrete oleo-resin from Pinus paulstris Miller, and from other species of Pinus. The oil is distilled, usually by the use of steam, from the oleo-resin.

Habitat.—Southern United States, from Virginia to the Gulf of Mexico.

Properties.—A thin, colorless liquid, having a char-

acteristic odor and taste. Soluble in three times its volume of alcohol; also soluble in an equal volume of glacial acetic acid.

Dose.—Carminative—Horses and cattle, 1 to 2 oz.; sheep and pigs, 1 to 4 dr.; dogs, 5 to 30 m. Best given in 8 to 10 times its bulk of cotton seed oil, linseed oil or milk. Anthelmintic—Horses and cattle, 2 to 4 oz.; sheep and pigs, ½ to 1 oz.; dogs, ½ to 4 dr. Diuretic —Horses and cattle, 2 to 4 dr.

PREPARATIONS

LINIMENTUM TERBINTHINAE — TURPENTINE LINIMENT

Composed of resin cerate, 650 parts; oil of turpentine, 350 parts; melt the resin cerate and add the oil of turpentine.

OLEUM TEREBINTHINAE RECTIFICATUM—RECTIFIED OIL OF TURPENTINE

Made by slaking oil of turpentine with an equal volume of Solution of Sodium Hydroxide, and distillation.

Properties.—A thin, colorless liquid, having the same properties as oil of turpentine and should be the one used for internal use.

DERIVATIVES OF TURPENTINE

TEREBENUM—TEREBENE

Made by the action of sulphuric acid on oil of turpentine and by distillation.

Properties.—A colorless, or slightly yellowish, thin liquid, having a rather agreeable thyme-like odor, and an aromatic, somewhat terebinthinated taste. Only slightly soluble in water, but soluble in three times its volume of alcohol.

Dose.—Horses and cattle, 2 to 4 dr.; dogs, 5 to 15 m. Dilute same as oil of turpentine.

TERPINI HYDRAS—TERPIN HYDRATE

The hydrate of the diatomic alcohol Terpin.

Derivation.—Rectified oil of turpentine, alcohol

and nitric acid are mixed together in a shallow porcelain dish, and after three or four days terpin hydrate crystallizes out. The crystals are collected, drained, dried on absorbent paper and purified by recrystallization in alcohol.

Properties.—Colorless, crystals, odorless, having a somewhat bitter taste. Soluble in 200 parts of water, 10 parts of alcohol.

Actions.—Externally—Oil of turpentine is rubefacient, irritant and counter-irritant; vesicant if rubbed in or confined, also a powerful antiseptic and disinfectant; is absorbed by the unbroken skin.

Internally—Is diuretic, stimulant, carminative, antispasmodic, hemostatic and althelmintic; it is irritant, and large undiluted doses may cause gastro-enteritis and paralysis of nerve centers.

Uses.—In colic, both spasmodic and flatulent; for worms, give full doses, septic fevers; gangrene of the lungs; catarrhal conditions, pneumonia and bronchitis; as a diuretic, but others not as irritant are better.

For local gangrene remove the dead tissue and then apply the turpentine direct to the affected parts by means of absorbent cotton or cloth saturated with it; the offensive odor is removed and sloughing arrested. For tape worm it is given with oleo-resin of aspidium, in oil. As an inhalation in pulmonary diseases one-half ounce is added to three quarts of boiling water. In two drachm doses every three hours, if frequently, aborts suppuration in parotiditis of horses. In purpura haemorrhagica, turpentine is a valuable medicine as a vasomotor stimulant and diuretic, given in two drachm doses every four hours with tincture chloride of iron and linseed oil.

OLEUM TIGLII—CROTON OIL

A fixed oil expressed from the seed of Croton Tiglium Linne.

Habitat.—Asia, India, Indian Archipelago and Philippine Islands.

Properties.—A pale yellow or brownish-yellow,

somewhat viscid, and slightly fluorescent liquid, having a slight fatty odor, and a mild, oily afterwards acrid and burning taste (great caution is necessary in tasting). Specific gravity 0.935 to 0.950 at 25° C. (77° F.).

CONSTITUENTS.—Crotonoleic acid is the purgative principal. A small amount is free in the oil but it is mostly formed within the bowels. It resembles acid of castor oil in its chemistry; crotonol is a non-purgative body causing irritation of the skin; tiglinic acid and other volatile acids existing as glycerides and accounting for the odor of croton oil; it also contains free and combined fatty acids.

DOSE.—Horses, 15 to 30 m.; cattle, ½ to 1 dr.; sheep and pigs, 5 to 10 m.; dogs, ½ to 2 m.

ACTIONS.—It is a powerful irritant and pustulant, is a drastic hyragogue cathartic; full doses cause gastro-enteritis and much prostration; undiluted it seriously and deeply inflames the skin, causing severe blemishes and by absorption it may cause fever and superpurgation. The purgative action is probably due in part to direct irritation of the intestinal mucous membrane; in part to absorption and elimination of the purgative principle by the bowels.

USES.—Cattle are the only animals for which it can be used with any degree of safety; it can be used for dogs and pigs if used with great caution. For horses and sheep it is too irritating and depressing; it is used in cattle as an active hydragogue purgative when they suffer from lodgment of fecal matter in the third stomach and other forms of constipation, and from torpidity of the bowels. Should not be used in debilitated, delicate or young animals. If an over-dose has been given combat with demulcents, opium and stimulants. It should not be used as a counter-irritant or applied to the skin in any form or for any purpose. Croton oil (in a pint of linseed oil) is valuable in assisting the action of salts in obstinate constipation of cattle. It may be given to horses when a powerful derivative and purgative action

is indicated, as in acute inflammation of the brain and spinal cord with calomel and aloes in a capsule.

OPIUM

Derivation.—The concrete, milky exudate obtained by incising the unripe capsules of Papaver somniferum Linne, and yielding in its normal, moist condition, not less than nine per cent of crystallized morphine when assayed by the official process. Opium is imported from Turkey, Asia Minor, Persia, India and Egypt. The Smyram, or Turkey opium, is the more common variety used in the United States. It occurs in irregular, globular masses, covered with poppy leaves and capsules of a species of dock, weighing from one-half to one pound.

Properties.—In irregular, flattened, more or less rounded masses of variable size, externally grayish-brown, covered with particles of poppy leaves and with occasional fruits of a species of Rumex; more or less plastic when fresh, but becoming hard on keeping; internally dark brown, somewhat lustrous; odor strong, narcotic; taste bitter and characteristic. It yields its medical properties to water, alcohol and dilute acids, forming dark brown solutions. Ether extracts its principles in part.

Constituents.—There are about nineteen or twenty alkaloids derived from opium, but only a few are of any importance so far as their medical value is concerned.

Dose.—Of the crude opium—Horses, 1 to 2 dr.; cattle, 2 to 4 dr.; sheep, 10 to 30 gr.; pigs, 5 to 10 gr.; dogs, ½ to 2 gr.

PREPARATIONS

OPII PULVIS—POWDERED OPIUM

This is opium dried at a temperature not exceeding 85° C. (185° F.) and powdered and should not contain less than 12 per cent nor more than 12½ per cent morphine.

Dose.—Horses, ½ to 1½ dr.; cattle, 1 to 3 dr.; sheep, 5 to 30 gr.; pigs, 5 to 15 gr.; dogs, ¼ to 3 gr.

EXTRACTUM OPII—EXTRACT OF OPIUM

Composed of powdered opium, 100 parts; distilled water, 1000 parts; sugar of milk, a sufficient quantity. Made by trituration, filtration and evaporation. Assayed to contain 20 per cent of morphine.

DOSE.—Horses, ½ to 1 dr.; cattle, 1 to 2 dr.; sheep, 5 to 15 gr.; pigs, 3 to 10 gr.; dogs, ¼ to 2 gr.

PULVIS IPECACUANHAE ET OPII—POWDER OF IPECAC AND OPIUM—DOVER'S POWDER

Composed of ipecac, 10 parts; powdered opium, 10 parts; sugar of milk, 80. The most diaphoretic and expectorant compound of opium.

DOSE.—Horses, ½ to 1 oz.; dogs, 2 to 12 gr.

TINCTURA IPECACUANHAE ET OPII—TINCTURE OF IPECAC AND OPIUM—LIQUID DOVER'S POWDER

Composed of tincture of deodorized opium 100, evaporated to 80, fluid extract of ipecac 10, diluted alcohol sufficient quantity to make 100.

DOSE.—Horses, ½ to 1 oz.; dogs, 3 to 12 m.

TINCTURA OPII—TINCTURE OF OPIUM

Popularly Known as Laudanum

Composed of granulated opium, 100 parts; alcohol, 400 parts; water, 400 parts; diluted alcohol to make 1000. Made by trituration, maceration with precipitated calcium phosphate and percolation. Assayed and standardized to contain between 1.2 and 1.25 gm. of morphine in 100 c. c.

DOSE.—Horses, 1 to 2 oz.; cattle, 2 to 3 oz.; sheep and pigs, 2 to 4 dr.; dogs, 3 to 20 m.

TINCTURA OPII CAMPHORATA—CAMPHORATED TINCTURE OF OPIUM

Well Known as Paregoric

Composed of powdered opium, 4 parts; benzoic acid,

4 parts; camphor, 4 parts; oil of anise, 4 parts; glycerine, 40 parts; diluted alcohol to make 1000 parts. Made by maceration and filtration.

Dose.—Dogs, 1 to 4 dr.; puppies and cats, 2 to 10 m.

OPIUM DEODORATUM—DEODORIZED OPIUM

Composed of powdered opium, 500 parts; purified petroleum, q. s. Made by repeated maceration, agitation and percolation with purified petroleum benzine. The petroleum benzine removes narcotic and odorous principles, which cause nausea and disagreeable after-effects in opium. Contains 12 to 12.5 per cent of morphine.

Dose.—Same as powdered opium.

VINUM OPII—WINE OF OPIUM

Composed of opium, cloves, cinnamon and sherry wine. Recommended for dogs suffering from diarrhoea.

Dose.—Same as the tincture of opium.

MORPHINA—MORPHINE

An alkaloid obtained from opium.

Properties.—Colorless or white, shining prismatic crystals, or fine needles, or crystalline powder; odorless and having a bitter taste; permanent in the air; soluble in 3330 parts of water. The latter are preferable owing to their greater solubility.

MORPHINAE HYDROCHORIDUM—MORPHINE HYDROCHLORIDE

Morphine is stirred with hot distilled water, to which hydrochloric acid is gradually added. Morphine hydrochlorate crystallizes out on cooling.

Properties.—White silky, glistening needles or microcrystalline cubes, or a white, crystalline powder, odorless and having a bitter taste; permanent in the air. Soluble in water and alcohol; insoluble in ether and chloroform.

DOSE.—Horses and cattle, 3 to 10 gr.; sheep, ½ to 2 gr.; pigs, 1/10 to ½ gr.; dogs, ⅛ to ½ gr. About one-half of these doses for hypodermic use.

MORPHINAE ACETAS—MORPHINE ACETATE

Morphine is dissolved in acetic acid and water and the solution evaporated and crystallized.

PROPERTIES.—A white or faintly yellowish-white, crystalline, amorphous powder, having a faint, acetous odor and bitter taste. Soluble in water and alcohol.

DOSE.—Same as morphine hydrochloride.

MORPHINAE SULPHAS—MORPHINE SULPHATE

Morphine is stirred into boiling distilled water; diluted sulphuric acid is added until neutralization is attained, and the sulphate crystallizes out on cooling.

PROPERTIES.—White, feathery, acicular, silky crystals, or in cubical masses, odorless, permanent in the air, and having a bitter taste. Soluble in water and alcohol, insoluble in chloroform and ether.

CODEINA—CODEINE

An alkaloid obtained from opium by evaporation of the ammonical liquid, after the precipitation of morphine. The residue is added to water, precipitated by potassium hydrate, and redissolved in ether, from which codeine crystallizes out on evaporation.

PROPERTIES.—White or nearly translucent, orthorhobic prisms, octahedral crystals, or a crystalline powder; odorless and having a faintly bitter taste; slightly efflorescent in warm air. Soluble in water, alcohol, ether and chloroform.

DOSE.—Dogs, ¼ to 1½ gr.

HEROIN—DIACETYLMORPHINE

This drug is a derivative of morphine, and is now used extensively in human medicine as a substitute for morphine and codeine.

Properties.—White or colorless, crystalline powder, possessing a slightly bitter taste. Insoluble in water, but readily soluble in weak acidous solutions. Heroin hydrochloride is a white, crystalline powder, odorless, soluble in 2 parts of water. Heroin surpasses both morphine and codeine therapeutically in many ways. It increases markedly the inspiratory and expiratory force, while lessening the number of the respiratory movements and exerts a special sedative influence on the respiratory mucous membranes. The drug acts also as a general motor depressant, hypnotic and analgesic, but is not comparable to morphine in these respects. Heroin is about five times more toxic for dogs than morphine. Heroin is particularly valuable in the treatment of all varieties of coughs affecting the dog. The after-effects of small doses are not as nauseating or constipating as morphine.

Heroin can be given in powder, pill or tablet, the Heroin hydrochloride in solution, every three or four hours.

Dose of Either.—Horses, ½ to 2 gr.; dogs, 1/24 to 1/6 gr.

Actions.—Opium is analgesic, hypnotic, diaphoretic, antispasmodic, narcotic; also cardiac and respiratory depressant after primary brief stimulation.

Medical Doses.—It dries all secretions except the mammae and skin. The latter being increased, it produces dryness of the mouth and throat, arrests gastric secretions, retards digestion and causes anorexia (loss of appetite); it stimulates the brain by increasing the blood supply; in man it stimulates the mantal activity, while in animals it stimulates motor activity; it does not affect the conductivity of nerves, but it prevents the consciousness to pain by paralyzing the nerve centers; the action of the heart is increased and arterial tension is raised; the pupil slightly contracted; the mind at first stimulated, becomes calm, sleep follows, disturbed by dreams and headache; constipation and some depression follows.

Large Doses.—Arrest digestion, cause nausea and vomiting, greatly increase perspiration, prevents the conductivity of nerves, depresses the heart and circulation, impairing oxidation and lowering temperature; it contracts the pupil by stimulating the motor nerve of the eye (in horses it dilates the pupil) and causes intense puritis (itching), especially of the nose, often retention of the urine and soon profound sleep; in some cases coma or delirium, leaving as after-effects nausea, depression, constipation, vertigo, anorexia, nasal puritis and fetid pathological secretions.

Morphine and codeine compared with the action of opium. Morphine is more anodyne and hypnotic; it causes more intense puritis (itching) is less stimulant, less convulsant, less constipating and diaphoretic.

Codeine is a motor paralyzant; it exalts the spinal cord more than morphine and affects the cerebrum less, producing muscular tremors in excess of sedation; it reduces the urinary sugar in diabetes and has a selective sedative influence on the pneumogastric nerve, thus a better sedative in cough.

Indications for the use of Opium:

1. To relieve pain and spasm.
2. To produce sleep.
3. To abort inflammation.
4. To check excessive secretions.
5. To act as a stimulant and supporting agent.
6. As a sudorific (not so active in animals as in man).

Sulphuric ether administered with opium prevents its drying up effects as well as the nauseating and depressing effects. Used for pain from any cause except acute inflammation of the brain. Used in low fevers to support the system when sufficient food cannot be taken, also in irritation of bronchi, bladder, stomach and bowels, as well as the uterus.

In inflammation of the serous membranes which line the abdominal walls (peritonitis) opium can be used

freely; combined or alternated with aconite and diuretics is very highly recommended and tends to prevent dropsical conditions.

In inflammation of the serous membrane investing lungs and lining the thorax (pleurisy) opium and aconite will often arrest its development if administered in its first stages.

In diarrhoea and dysentery opium is said to be one of the best medicines we have, it can be combined with acetate of lead, prepared chalk, etc.

In inflammation of the bowels, owing to its effect in binding up the bowels, belladonna alternated with aconite is preferred to opium.

In colds administer Dover's Powder, or opium, ammonium carbonate, quinine sulphate and camphor.

In spasmodic colic do not use opium, but give hypodermically three to four grains of morphine sulphate; it is non-constipating; also use anodynes, such as cannabis indica, hyoscyamus, etc., are preferable.

In gastritis, opium conjoined with bismuth sub. nitrate and hydrastis.

In eversion of the rectum or uterus, administer morphine hypodermically to prevent straining.

In muscular spasms opium is very effective.

In cerebro-spinal meningitis opium should be administered early, before exudation has set in, with belladonna and ergot, alternated with aconite.

In diabetes millitus, codeine is said to be best, as it lessens the amount of sugar in the urine and should be administered by the mouth; if given hypodermically it exerts no influence on the sugar.

In catarrhal diseases administer opium to lessen the discharge.

In Thumps administer full doses of morphine subcutaneously.

In inflammation of the eyes morphine sulphate is very efficient combined with zinc sulphate and distilled water.

Toxic Doses.—Produce cold clammy sweat, very

slow heart, diminished quantity of urine, abolished reflexes, coma, the pupil minutely contracted (except in the horse) but dilated as the end approaches and death by suspension of respiration, due to direct action of the poison on the respiratory centers in the medulla.

In case of poisoning. Emetics, stomach pump, permanganate of potassium, grain for grain of morphine, or 10 to 15 grains dissolved in 8 ounces of water, given by the mouth for large dogs, and 1 to 2 drachms of permanganate of potassium in 2 or 3 pints of water for horses. Artificial respiration, striking the body, keep patient moving, empty bladder to prevent absorption.

APOMORPHINE HYDROCHLORIDUM—APOMORPHINE HYDROCHLORIDE

Derivation.—The hydrochloride of an artificial alkaloid, obtained by heating morphine or codeine in hermetically closed tubes with an excess of pure hydrochloric acid.

Properties.—Minute, grayish-white, shining monoclinic prisms, without odor, having a faintly bitter taste and acquiring a greenish tint upon exposure to light and air. It should be kept in small, dark, amber-colored vials. Soluble in water, alcohol, ether and chloroform.

Dose.—As an emetic for dogs, 1/8 to 1/5 gr., by the mouth, and 1/20 to 1/10 gr, subcutaneously.

Dose.—As an expectorant, subcutaneously, horses, 3/4 gr.; foals, 1/2 gr.; cattle, 1 1/2 gr.; sheep and calves, 1/2 gr.; dogs, 1/10 to 1/5 gr. By the mouth, dogs, 1/40 to 1/25 gr as an expectorant.

Action and Uses—It is a prompt and effectual emetic in animals that vomit, acting on the vomiting centers. When 1/5 gr. dissolved in water is swallowed by either man or dog repeated vomiting occurs, but is not followed by so much nausea as usually follows the use of tartar emetic. Increases bronchial, intestional and pancreatic secretions. Chronic dry bronchitis of dogs is benefited by apomorphine. In pica cattle, 1 1/2 gr.

may be given on three consecutive days, or in recent cases, 3 gr. are given subcutaneously in the same way. It relieves choking in animals by its relaxing spasm and increasing secretion of the gullet. Three-quarters of a grain may be injected under the skin in horses. It should be tried before using a probang, as, if successful, it will act within fifteen or twenty minutes. The alkaloid decomposes in crystal and rapidly in solution, becoming toxic and of a green hue. Solutions should be freshly prepared.

PETROLATUM LIQUIDUM—LIQUID PETROLATUM

Derivation.—A mixture of hydrocarbons, chiefly of the marshgas series, obtained by distilling off the lighter and more volatile portions from petroleum and purifying the residue when it has the desired consistence.

Properties.—A colorless, or more or less yellowish, oily transparent liquid without odor or taste; or giving off, when heated, a faint odor of petroleum. Insoluble in water; scarcely soluble in cold or hot alcohol, or cold absolute alcohol; but soluble in ether, chloroform, carbon disulphide, oil of turpentine, benzine, benzol and fixed and volatile oils.

PETROLATUM—VASELINE—COSMOLINE

Derivation.—A mixture of hydrocarbons, chiefly of the marshgas series, obtained by distilling off the lighter and more volatile portions from petroleum and purifying the residue when it has reached the desired melting point.

Properties.—A fat-like mass of about the consistence of an ointment varying in color from yellowish to light amber, having not more than a slight fluorescence, even after being melted; transparent in thin layers, completely amorphous and without odor or taste, or giving off when heated a faint odor of petroleum. In other respects soft petrolatum has the solubility of liquid petrolatum.

PETROLATUM ALBUM—WHITE PETROLATUM

Derivation.—A mixture of hydrocarbons, chiefly of the methane series, obtained by distilling off the lighter and more volatile portions from petroleum and purifying the residue.

Properties.—A white, unctuous mass, of about the consistency of an ointment, transparent in thin layers, completely amorphous; without odor or taste. Otherwise it resembles, in solubility, petrolatum.

Action.—All preparations of petrolatum are valuable emollients. They soothe, protect and soften parts to which they are applied and are superior to animal or vegetable fats or oils in not becoming rancid.

Uses.—Petrolatum may be used alone, or as an excipient in the preparation of ointments, but does not aid the absorption of drugs (as do alcohol, glycerine, chloroform, animal oils and fats), for it is not itself absorbed even when administered internally. Petrolatum exerts a demulcent action upon the mucous membrane of the alimentary tract, and may be prescribed in electuary or capsule in inflammation thereof. Liquid petrolatum is useful given internally in piles (dogs one-half ounce twice daily) to soften the feces. It is also very serviceable with menthol and camphor (equal parts, fifteen grains to one ounce) dropped in the nostrils (with a medicine dropper) for dogs with acute nasal catarrh. Petrolatum is sold universally under the proprietary names of vaseline and cosmoline, and is often combined with antiseptics for medical and surgical purposes in skin diseases and upon inflamed mucous membranes, blisters and abraded surfaces and sores. It is one of the most useful agents in lubricating instruments, protecting metal from rust, and is sometimes employed as a vehicle for electuries. It should not be used as a base for blisters or other ointments where absorption is desired.

PIX LIQUIDA—TAR

An empyreumatic oleo-resin obtained by the destructive distillation of the wood of various species of pines, especially that of Pinus palustris.

Habitat.—United States.

Properties.—Thick, viscid, semi-fluid, blackish-brown; heavier than water, transparent, in thin layers, becoming granular and opaque with age; odor empyreumatic terbinthinated; taste sharp empyreumatic. Tar is slightly soluble in water; soluble in alcohol, fixed or volatile oils and solutions of potassium or sodium hydrate.

Constituents.—Oil of turpentine; methlic alcohol; creosote; guaiacol; phenol; pyrocatechin; toluol; xylol; acetic acid; acetone; resins.

Dose.—Horses and cattle, ½ to 1 oz.; sheep and pigs, 1 to 2 dr.; dogs, ¼ to 1 dr. Oil of tar should be diluted with alcohol, glycerine, syrup or mucilage.

PREPARATIONS

UNGUENTUM PICIS LIQUIDAE—TAR OINTMENT

Composed of tar, 500; yellow wax, 150; lard, 350. Used alone as a healing ointment or as a base.

OLEUM PISIS LIQUIDAE—OIL OF TAR

A volatile oil distilled from tar.

Properties.—An almost colorless liquid when freshly distilled, but soon acquiring a dull, reddish brown color, and having a strong tarry odor and taste. Soluble in alcohol.

Dose.—Horses and cattle, 1 to 2 oz.; sheep and pigs, 2 to 4 dr.; dogs, ½ to 2 dr.

Actions.—Internally, is an antiseptic stimulant expectorant. Externally, it is rubefacient and if continually rubbed in may cause papules and pustules.

Uses.—Tar or the oil is commonly used in cough

mixtures and in subacute and chronic bronchitis. By inhalation (which is done by pouring tar on a heated shovel or a shovel containing live coals or by adding a pint of tar to a gallon of water, heating the mixture by placing hot bricks or stones in the solution) either method is excellent for its local antiseptic and stimulating effects in the various catarrhal diseases; bronchitis, distemper, strangles, etc. Care should be used so that the vapor be not inhaled too hot.

Externally, it is a very useful agent in various skin diseases, both parasitic and non-parasitic; for this the official ointment may be used, or if used on a large surface on dogs it should be diluted with an equal amount of zinc ointment.

PLUMBI OXIDUM—LEAD OXIDE

Derivation.—Made by roasting lead in the air.

Properties.—A heavy, yellowish or reddish-yellow powder, or minute scales, without odor or taste. Almost insoluble in water; insoluble in alcohol. Lead oxide is only valuable for its preparations.

PREPARATIONS
PLUMBI ACETAS—LEAD ACETATE—SUGAR OF LEAD

Derivation.—Heat lead oxide in acetic acid and water. Lead acetate crystallizes on cooling.

Properties.—Colorless, shining, transparent; monoclinic prisms or plates, or heavy, white crystalline masses, or granular crystals, having a faintly acetous odor and a sweetish, astringent, afterwards metallic taste. Efflorescent and absorbing carbon dioxide on exposure to the air. Soluble in two parts of water and in thirty parts of alcohol.

Dose.—Horses and cattle, ½ to 1 dr.; sheep and pigs, 15 to 20 gr.; dogs, 1 to 2 gr. Given in capsule or solution.

PREPARATIONS

LIQUOR PLUMBI SUBACETATIS — SOLUTION OF LEAD SUBACETATE— GOULARD'S EXTRACT

An aquous liquid, containing in solution about 25 per cent of lead subacetate.

Derivation.—Made from acetate of lead, 180 parts; oxide of lead, 110 parts; boiled together in water to make 1000 parts.

Properties.—A dense, clear colorless liquid, sweet, astringent taste, decomposed by exposure to the air.

Actions.—The lead compounds are powerful astringents, haemostatics, styptics, anodynes, local sedatives and desiccants; they coagulate albumen and form a protective coat, also contract small vessels. In large or continued doses they irritate, then paralyze voluntary and involuntary muscles, and also the central nervous system.

Uses.—Plumbi acetate is administered internally to check haemorrhages, especially of the stomach and lungs, has been used in purpura in horses with varying results; it is said to be very good in red water of cattle; also used in diabetes insipidus; for diarrhoea, lead acetate with opium is very good, also in dysentery, chronic scouring and bronchorrhoea; it is occasionally prescribed as a gargle.

Externally used in solution to check superficial inflammation; used on burns, bruises and ulcers, also to cool and relieve strained and inflamed tendons and joints, it is also used as a wash to abate the itching of nettle-rash and erythema and other skin diseases; also serviceable in eczema and grease-heel; used in eye wash but should not be used when there is an abrasion of the cornea, as insoluble compounds are formed; the acetate may be used as an ointment or powder or in solution dissolved in twenty to forty parts water, a little vinegar or acetic acid increases its solubility; it is used in white lotion combined with zinc sulphate and water.

Goulard's Extract, four ounces to a pint of water, is used for sprains, bruises, cuts, burns, scratches, grease-heel, etc. For painful affections, tincture of opium, four to six ounces to one pint, or belladonna, two ounces to the pint, are added. Goulard's Extract, one part, lard oil, four parts, makes a good dressing for blistered or bruised surfaces, grease-heel and other ailments of that class; for skin diseases, eczema, canker of ear in dog, etc.

POTASSII ACETAS—POTASSIUM ACETATE

DERIVATION.—Add acetic acid in excess to potassium carbonate. Evaporate to dryness and fuse residue.

PROPERTIES.—White, deliquescent, satiny, neutral masses of a peculiar odor; also in a granular form. Soluble in water and alcohol.

DOSE.—Horses and cattle, ½ to 1 oz.; sheep and pigs, ½ to 1 dr.; dogs, 5 to 20 gr.

POTASSII CITRAS—POTASSIUM CITRATE

DERIVATION.—Neutralize potassium carbonate with a solution of citric acid and evaporate to dryness.

PROPERTIES.—White, granular, deliquescent powder, saline taste, neutral reaction. Soluble in water.

DOSE.—Same as potassium acetate.

ACTIONS.—Potassium acetate and citrate are the least irritant to the stomach of all the potassium salts. They are neutral and have no action on the gastric juice: are not antacid. They are changed into the carbonate of potassium and as such circulate in the blood. Are powerful direct diuretics, stimulate the renal cells direct and increase both the water and the solids of the urine, also diaphoretic; the citrate more than the acetate. They have a slight depressing action on the heart, and slightly expectorant.

USES.—Potassium acetate and citrate are indicated in irritation or inflammation of the kidneys and bladder and cause absorption of exudations (pleural effusion, for example) through their diuretic power. They are sometimes prescribed in fever on account of slight diaphor-

etic and powerful diuretic properties. They also stimulate bronchial secretions and make it thinner and are recommended accordingly in bronchitis. They are used in gouty conditions, Bright's disease, fevers of all kinds, azoturia, dropsical conditions, pleurisy, ascites oedema of the legs, sheath, udder, etc., combined with tonics, as iron, etc.

POTASSII BROMIDUM—POTASSIUM BROMIDE

Derivation.—Potassium bromide may be obtained by adding a slight excess of bromide to a strong solution of potassium hydroxide, evaporating the potassium bromide and bromate to dryness, decomposing the bromate by fusing the mixture with charcoal and purifying the crystallization.

Properties.—Colorless, or white, cubical crystals, or granules; odorless and having a strong saline taste. Permanent in the air. Soluble in about fifteen parts of water and in about one hundred and eighty parts of alcohol.

SODII BROMIDUM—SODIUM BROMIDE

Derivation.—Sodium bromide may be obtained in the same manner as potassium bromide, sodium hydroxide being used in place of potassium hydroxide.

Properties.—It occurs in colorless or white, cubical crystals, or a white, granular powder, odorless and having a saline, bitter taste. The salt absorbs moisture from the air without deliquescing. Soluble in one and seven-tenths parts of water and in twelve and a half parts of alcohol.

Action of Potassium and Sodium Bromide.—They are distinguished depressants of the cerebral and spinal functions, also hypnotic, anaphrodisiac, antispasmodic and alterative. The bromide of potash, like all other potassium salts, is especially a cardiac and muscular paralyzant. They are very diffusible and slowly eliminated; long continued doses produce gastric ca-

tarrh. They reduce the number of respirations and the heart's action and force; lessen activity of brain cells, producing sleep; diminish sensibility of peripheral nerves, causing anesthesia of the skin and mucous membrane.

Uses.—The bromides, being particularly useful in the treatment of functional nervous diseases, do not possess nearly the value in veterinary medicine that they have in human practice. Consequently their use is limited mainly to canine disorders, as bromides have little influence upon diseases of horses. They are sometimes used as sedatives to the nervous system, to lower reflex activity, to produce sleep, to subdue excitement of the genital apparatus and to antagonize congestion of the brain. Used extensively in fits of dogs, twenty or thirty grain doses of the bromide of potash or bromide of soda dissolved in a tablespoonful of water; may be used per rectum if necessary in any convulsive or spasmodic condition. In strychnine poisoning, the bromide of potash may be used as an antidote in place of chloral hydrate or conjoined with it.

Doses.—Horses and cattle, 1 to 2 oz.; sheep and pigs, 2 to 4 dr.; dogs, 5 to 60 gr.; average dose, 20 gr.

POTASSII CARBONAS — POTASSIUM CARBONATE—SALTS OF TARTAR

Derivation.—The solution resulting from the lixiviation of wood ashes is boiled to dryness and the resultant mass is the potash of commerce. This is purified to some extent by burning in ovens, forming pearlash, a mixture of the hydrate and carbonate. Water dissolves mainly the carbonate which is obtained by evaporation of the aqueous solution.

Properties.—A white, granular powder, odorless and having a strongly alkaline taste; very deliquescent. Soluble in water; insoluble in alcohol.

Dose.—Horses and cattle, ½ to 1 oz.; sheep and pigs, ½ to 1 dr.; dogs, 5 to 20 gr.

POTASSII BICARBONAS—POTASSIUM BICARBONATE

Derivation.—Potassium bicarbonate is obtained by saturating a strong aqueous solution of potassium carbonate and carbonic anhydride.

Properties. — Colorless, transparent, monoclinic prisms, odorless and having a saline and slightly alkaline taste. Permanent in the air. Soluble in water. Almost soluble in alcohol.

Dose.—Same as potassium carbonate.

Action and Uses.—They stimulate the production of gastric juice when administered before meals with bitter tonics, or after meals to overcome excessive acidity of the stomach; used in rheumatism and gouty condition to make blood alkaline and overcome lactic acid. Useful as an antacid in nettle-rash and other itching skin diseases. Internally and externally as a mild wash, two to four drachms to the pint. A solution of the same strength is injected to overcome acidity of the uterus in leucorrhoea, etc. Calculus made up of ammonium, magnesium and phosphates occur in the bladder and urethra of highly fed rams and wethers. For this use potassium bicarbonate one-half to one drachm, well diluted, conjoined with laxative diet and belladonna to dilate urethra; it is less certain as a diuretic than the acetate or nitrate of potassium.

POTASSII HYDROXIDUM — POTASSIUM HYDROXIDE—CAUSTIC POTASH

Derivation.—A solution hydrate is evaporated, and this is fused and run into moulds.

Properties.—White, translucent pencils or fused masses, hard and brittle, showing a crystalline fracture; odorless or having a faint odor of lye and a very acid and caustic taste. Very deliquescent in air. Soluble in water and alcohol.

Not used in this form to any extent.

LIQUOR POTASSII HYDROXIDI—SOLUTION OF POTASSIUM HYDROXIDE

A solution of potassium hydroxide (caustic potash) containing about five per cent of the hydroxide.

Derivation.—Boiling a solution of potassium carbonate with calcium hydrate leaves potassium hydrate in solution, while calcium carbonate is precipitated.

Properties.—A clean, clear colored liquid, odorless, having a very acrid and caustic taste.

Dose.—Horses and cattle, ½ to 1 oz.; sheep and pigs, ½ to 1 dr.; dogs, 5 to 10 m.

Action and Uses.—Externally potassium hydroxide and the solution of potassium hydroxide are irritant and caustic, when applied they abstract water from the parts. They dissolve fatty matters, antacids and if well diluted acts as a sedative. Internally not used to any extent, as milder salts of potassium are preferred, is antacid, alterative, febrifuge and diuretic. Large undiluted doses corrode and inflame the alimentary tract, cause colicy pains, great depression and sometimes perforations. Caustic potash is sometimes used to destroy warts and fungous growths. A dilute solution is used to cauterize poisoned wounds, but is dangerous, as it may penetrate too deeply and spread. This can be overcome by washing with vinegar.

POTASSII IODIDUM—POTASSIUM IODIDE

Derivation.—Potassium iodide may be prepared in the same manner as potassium bromide iodine, being used in place of bromine.

Properties.—It is a colorless, transparent, translucent, or opaque white, cubical crystals, or white granular powder, having a peculiar, faint, iodine-like odor and a pungent, saline, afterwards bitter, taste. Permanent in dry air and but slightly deliquescent in moist air. Soluble in 0.7 parts of water, and in about 12 parts of alcohol at 77° F., in 0.5 parts of boiling water, in 6 parts of boiling alcohol; also soluble in 2.5 parts of glycerine.

Actions.—Potassium iodide closely resembles iodine

but is less powerful and devoid of local irritant action. Medical doses are antiseptic, desquamatic, deobstruent, expectorant, alterative and diuretic. It stimulates the lymphatic system. It is readily soluble, and is quickly absorbed in the tissues, where it undergoes decomposition; the iodine, when liberated, apparently combines with albumenoids and acts specially on the lymphatic glands and vessels, modifying nutrition, hastening metabolism and promoting absorption. It is doubtless in this way that it also unites with lead and mercury deposited in the tissues, renders them soluble, carries them into the circulation and causes their elimination.

It is quickly excreted by the mucus and skin surfaces, but chiefly by the kidneys.

Uses.—Potassium iodide is useful in promoting absorption of enlarged lymphatic glands, and its action should be assisted by the application of iodine or red iodide of mercury externally. Potassium iodide in small doses diminishes congestion and increases the fluidity and amount of secretions in acute laryngitis, acute and subacute bronchitis, and appears to possess an alterative action in improving the condition and nutrition of the bronchial mucous membranes. It is also of some value in asthma, pulmonary emphysema and chronic bronchitis, unassociated with copious secretion. Chronic pleuritis, pericarditis and ascites are treated with potassium iodide, which assists absorption and occasionally exerts a diuretic effect. Tardy resolution of pneumonia consolidation is hastened by potassium iodide. Endocarditis with cardiac hypertrophy is said to be benefited by potassium iodide and digitalis.

Champignon, or scirrhus cord in horses, is sometimes cured by the sorbefacient powers of potassium iodide in full doses. Potassium iodide is of value in goiter of dogs, calves and sheep when tincture of iodine is used externally. "Roaring" and "thick wind" may be cured by the administration of potassium iodide. It is the best medicine known for actinomycosis. Potassium iodide has a clinical reputation for its power to aid absorption and

resolution in inflammation or effusions of the brain or spinal cord, in paralysis of the body or limbs and inflammation of the membranes covering the brain.

Doses.—Horses, 2 to 4 dr.; cattle, 3 to 6 dr.; sheep and pigs, 15 to 30 gr.; dogs, 1 to 10 gr.

It should be given to the larger animals in doses of three drachms daily, until iodism appears, which shows itself by loss of appetite, an irritable, catarrhal condition of the mucous membranes of the nostrils, eyes, throat and digestive organs, a vesicular skin eruption, abstinence from water, diminished secretions of urine, temperature elevated and emaciation.

POTASSII NITRAS—POTASSIUM NITRATE—NITRATE OF POTASH—NITER—SALTPETRE

Derivation.—Nitrate of potash may be obtained by purifying crude niter, or by the interaction of sodium nitrate and potassium chloride.

Properties. — Colorless, transparent, six-sided, rhombic prisms, or a crystalline powder, odorless and having a cooling, saline and pungent taste. Permanent in the air. Soluble in water; very sparingly soluble in alcohol.

Dose.—Horses and cattle, 1 to 2 oz.; sheep and pigs, 2 to 6 dr.; dogs, 5 to 20 gr.

Actions.—Large doses irritate the stomach, bowels and kidneys; medical doses are alterative, febrifuge, diuretic and feebly laxative. Excreted by the bronchial glands, skin and kidneys, increasing secretions of these organs; is a cardiac depressant and mild refrigerant and diaphoretic.

Nitrate of potash is more frequently prescribed than any other potash salt in veterinary medicine, and is commonly considered one of the best febrifuges. Its only service in fevers is as a diuretic.

Uses.—In certain febrile conditions; in oedema of legs should be combined with digitalis and general tonics. For dropsical conditions the acetate and citrate are better.

Nitrate of potash is highly recommended in acute laminitis, two to four ounces once or twice daily is given by some veterinarians.

POTASSII CHLORAS—POTASSIUM CHLORATE

Derivation.—Pass chlorine into a mixture of potassium carbonate and calcium hydrate; dissolve the result in boiling water and recover the chlorate by crystallization.

Properties.—Colorless, lustrous, monoclinic prisms or plates, or white powder, odorless, having a cooling, saline taste. Permanent in the air. Soluble in water. Insoluble in absolute alcohol, but slightly soluble in mixtures of alcohol and water. Explodes readily when rubbed with sugar, sulphur, charcoal, glycerine and many other substances.

Dose.—Horses and cattle, 2 to 6 dr.; sheep and pigs, ½ to 1 dr.; dogs, 5 to 20 gr.

Action.—Chlorate of potash is antiseptic, antacid, alterative, sialagogue, diuretic, febrifuge, and cardiac depressant: irritant to the gastro-intestinal tract and kidneys. Externally, antiseptic, mild stimulant and refrigerant. Is a protoplasmic poison, as is the nitrate; disintegrates the red blood corpuscles.

Uses.—Chlorate of potash is valuable as a wash or gargle, it stimulates the salivary and buccal glands, moistening the dry, parched mouth. It soothes and heals aphthous eruptions and ulcerations of the mouth and throat: while in catarrh, sore throat and bronchitis it thins the secretions and promotes expectoration. Like other salines, in febrile and inflammatory diseases, whether in horses or cattle, it is believed to lower pulse and temperature, clean the tongue, improve appetite, gently stimulate the bowels and render the evacuations more natural and less coated with mucus. It is frequently prescribed with good results in horses suffer-

ing from catarrhal conditions of the bowels. In epizootic catarrh, purpura, it is very beneficial prescribed with iron salts, as it increases the coagulability of the blood. It is also prescribed with other salines, bitter tonics or stimulants. Most animals of their own accord will take an ounce daily, dissolved in their drinking water or gruel. Pine tar is a soothing electuary for sore throat, it is conjoined with camphor, belladonna and treacle.

POTASSII BITARTRAS—POTASSIUM BITARTRATE—CREAM OF TARTAR

Derivation.—Obtained from crude tartar deposited on the sides of wine casks during fermentation of grape juice, by purification.

Properties.—Colorless or slightly opaque, rhombic crystals, or a white, somewhat gritty powder; odorless and having a pleasant, acidulous taste. Permanent in the air. Soluble in water; very sparingly soluble in alcohol.

Dose.—Horses and cattle, ½ to 1 oz.; sheep and pigs, 2 to 4 dr.; dogs, ½ to 1 dr.

Actions.—Potassium bitartrate is a non-irritating purgative in large doses. It is a hydragogue cathartic and has a strong affinity for water; abstracting it from the blood vessels in the bowels, holding the same in solution and thus flushing out the intestines.

Uses.—Is used for liver disease, chronic constipation, skin disease and as a refrigerant in febrile conditions. It should be given in solution and is useful in dropsies, more particularly of renal origin; also in catarrhal jaundice, and as a laxative for foals and calves. In cases where the urine of the horse is thick, stringy and high colored, it will cause it to regain its normal state. It may easily be administered in either food or drinking water, and its diuretic effect is enhanced when given with a large amount of water.

POTASSII PERMANGANAS—POTASSIUM PERMANGANATE—PERMANGANTE OF POTASH

Origin.—Potassium permanganate may be obtained by the interaction of potassium chlorate, potassium hydroxide and manganese dioxide.

Actions.—Potassium permanganate is a powerful oxidizing agent and readily yields up its oxygen in the form of ozone; hence it is an antiseptic and deodorizer. Full strength it is a mild caustic. Diluted it is astringent.

Uses.—Potassium permanganate is advantageously used to deodorize and disinfect foul smelling wounds, the nostrils in eczema, nasal gleet, the mouth in aphthae, throat when ulcerated, diphtheria, the uterus in metritis, retention of placenta and leucorrhoea. It is sometimes given internally in purperal, erysipelas and septicaemia, also to cleanse hands or instruments. Potassium permanganate is used as a prophylactic in solutions of one in five thousand in poultry.

Potassium permanganate acts as an oxidizant much more freely upon some organic substances than upon others, by virtue of which fact it is a valuable antidote, notably in the treatment of morphine-poisoning and of snake-poisoning. In the former condition it acts only upon the alkaloid in the stomach, but should be given frequently during the continuance of the symptoms in order to destroy any morphine which may have been eliminated from the blood into the stomach. In snake-poisoning a concentrated solution of it should be injected freely and immediately into the part which has been bitten. Potassium permanganate is one of the best medicines with which to sterilize the hands before operating. A saturated solution is used for this purpose and the stains may be removed from the hands by washing them in saturated solution of oxalic acid, or in a dilute solution of hydrochloric acid.

Dose.—Horses and cattle, 15 gr. to 1 dr. in one pint of water; sheep and pigs, 5 to 10 gr. in half pint of wa-

ter; dogs and cats, ½ to 11 gr. in capsule with kaolin. For poultry it should be diluted one part to five thousand parts of water.

As an antiseptic and deodorizer for disinfecting newly cut or old foul smelling wounds and for surgical purposes one drachm to half an ounce of the drug to one pint of water.

As an eye wash use about one in two thousand to one in one thousand.

For uterine injections use one in five thousand to one in two thousand.

As an antidote for opium, morphine or weed-poisoning it can be administered by the mouth or hypodermically. When given for these purposes the amount of potassium permanganate should equal that of the poison taken.

QUSSIA—BITTER WOOD

Qussia is obtained from chips or shavings from a tall tree 70 to 100 feet high.

HABITAT.—Jamaica and other West Indian Islands.

PROPERTIES.—Qussia has no odor, but an intensely bitter taste, dependent on a neutral crystalline principle, quassin. There is also a volatile oil, but no tannin.

PREPARATIONS

EXTRACTUM QUASSIAE—EXTRACT OF QUSSIA

Made by percolation with water, boiling and evaporation to pilular consistence.

DOSE.—Horses and cattle, 1 to 2 dr.; sheep and pigs, 15 to 30 gr.; dogs, ½ to 3 gr.

FLUIDEXTRACTUM QUASSIAE—FLUIDEXTRACT OF QUSSIA

Made by maceration and percolation with alcohol and water and evaporation.

DOSE.—Horses and cattle, 1 to 2 oz.; sheep and pigs, 2 to 4 dr.; dogs, 15 m. to 1 dr.

TINCTURE QUSSIAE—TINCTURE OF QUSSIA

Made by maceration and percolation of qussia, 200 parts; with alcohol and water to make 1000.

Dose.—Horses and cattle, 2 to 4 oz.; sheep and pigs, ½ to 1 oz.; dogs, ½ to 2 dr.

Action and Uses.—Qussia is a bitter stomachic and tonic. It resembles gentian and calumba. It is prescribed for the several domestic animals in dyspepsia, loss of appetite and convalescence from debilitating disorders. Qussia is the most efficient vermicide in our possession for the destruction of Oxyuris curvula, horse; and O. vermicularis, dog, in the lower bowel. An infusion is employed for this purpose, made by soaking qussia chips in cold water (two drachms of the qussia to one pint of water) for half an hour. The rectum should be first thoroughly washed out with soap and water and one-half pint of this infusion is given in enema to dogs; two quarts to horses. The infusion is a narcotic poison for flies and other insects.

JALAPA—JALAP

The dried tuberous roots of Exogonium Purga Bentham, yielding not less than eight per cent of total resin, but not more than one and a half per cent of the resin soluble in ether.

Habitat.—Southern United States and Mexico.

Properties.—The root is dark brown, with numerous concentric circles composed of small resin cells; fracture resinous, lustrous, not fibrous; odor slight, but peculiar, smoky and sweetish; taste sweetish and acrid.

Dose.—Pigs, 2 to 4 dr.; dogs, 1 to 2 dr.; cats, ½ to 1 dr.

RESINA JALAPA—RESIN OF JALAP

Made by maceration and percolation with alcohol, partial distillation; precipitation with water; washing and drying.

Properties.—Yellowish-brown powder, having a slight, peculiar odor, and a somewhat acrid taste. Per-

manent in air. Soluble in alcohol, ether, fixed and volatile oils.

Dose.—Pigs, 30 gr. to 1 dr.; dogs, 15 to 30 gr.; cats, 5 to 15 gr.

Action and Uses.—Jalap is a hydragogue cathartic, a vermifuge and cholagogue. By adding calomel to jalap its power is increased; jalap is more active than senna, but is less powerful and irritating than gamboge or podophyllum. Jalap may be given to expel round and thread worms; in torpidity of the liver, and in chronic constipation in dogs.

PREPARATIONS

PULVIS JALAPA COMPOSITUS—COMPOUND POWDER OF JALAP

Composed of jalap, 35 parts; potassium bitartrate, to make 100.

Dose.—Dogs, 15 to 30 gr.

RHAMNUS PURSHIANA — CASCARA SAGRADA—CALIFORNIA BUCKTHORN CHITTEM BARK

The bark of Rhamnus Persiana de Candolle (nat. ord. Rhamnaceae). Collected at least one year before being used.

Habitat.—United States from Northern Idaho west to the Pacific Ocean.

Properties.—Externally the bark is reddish-brown. Internally yellowish to light brownish, becoming dark with age. Odor distinct; taste bitter and slightly acrid.

Constituents.—Three resins; a neutral body; a volatile oil; malic and tannic acids.

Dose.—Dogs, 5 to 30 gr.; cats, 1 to 5 gr.

PREPARATIONS

FLUIDEXTRACTUM RHAMNI PURSHIANAE FLUIDEXTRACT OF RHAMNUS PURSHIANA

Made by maceration and percolation with diluted alcohol, and evaporation.

Dose.—Dogs, 5 to 30 m.; cats, 1 to 5 m.

FLUIDEXTRACTUM RHAMNI PURSHIANA AROMATICUM
AROMATIC FLUIDEXTRACT OF CASCARA SAGRADA

Dose.—Dogs, 5 to 30 m.; cats, 1 to 5 m.

Action and Uses.—Used as a non-irritant tonic laxative or cathartic; small doses are stomachic; to overcome chronic constipation, give small repeated doses; very useful in canine practice. The aromatic fluidextract is the best preparation, and is occasionally given to dogs and cats with castor oil.

RHEUM—RHUBARB

The dried roots of Rheum, of which there are several species.

Habitat.—China and Thibet.

Properties.—When powdered it is of a bright orange-yellow, odor characteristic; taste bitter, astringent; gritty when chewed.

Dose.—As a stomachic—Horses and cattle, 1 to 2 ozs.; sheep, 1 dr.; dogs and cats, 5 to 10 gr.

As a mild purgative—Foals and calves, 1 to 2 dr.; dogs and cats, ½ to 2 dr.; poultry, 5 to 10 gr., in pill.

PREPARATIONS

FLUIDEXTRACTUM RHEI—FLUIDEXTRACT OF RHUBARB

Made by maceration and percolation with alcohol and water, and evaporated.

Dose.—Same as that of rhubarb.

PULVIS RHEI COMPOSITUS — COMPOUND POWDER OF RHUBARB—GREGORY'S POWDER

Composed of rhubarb, 25 parts; magnesia, 65 parts; ginger, to make 100.

Dose.—Foals and calves, ½ to 1 oz.; dogs, ½ to 3 dr.

TINCTURE RHEI AROMATICA—AROMATIC TINCTURE OF RHUBARB

Composed of rhubarb, cloves, cinnamon and nutmeg.

Dose.—Calves, 2 dr. to 1 oz.; foals, 2 to 6 dr.; sheep, 4 dr. to 1 oz.; lambs, ½ to 2 dr.; dogs, ½ to 3 dr.

Action and Uses.—Rhubarb is a stomachic, tonic, astringent, mildly cathartic and cholagogue. Rhubarb is useful where there is a lack of tone to the bowels; used in diarrhoea in small doses, for its stimulating tonic action; as a laxative in large doses or may be combined with other laxatives, to prevent griping in milk-fed animals, or may be combined with bismuth, opium or sulphuric acid, to stop diarrhoea; as a laxative or purgative. The fluidextract or powdered root may be combined with calomel, jalap, etc.

SALICINUM—SALICIN

A neutral principle (glucoside) obtained from several species of the willow and poplar tree.

Habitat.—Europe, but cultivated in North America.

Derivation.—Obtained from a decoction of willow bark. Salicin crystallizes on evaporation, after removal of tannin by agitation with lead oxide. It is purified by repeated solution and crystallization.

Properties.—A white, silky, shining crystalline needle, or colorless crystalline powder; odorless, and having a very bitter taste. Permanent in air. Soluble in 28 parts of water and 30 parts of alcohol.

Dose.—Horses and cattle, 2 dr. to 1 oz.; sheep, 1 to 4 dr.; pigs, ½ to 1 dr.; dogs, 5 to 30 gr.

Actions.—Bitter tonic, antipyretic, antiferment and antiseptic, somewhat antiperiodic resembling quinine in its actions, but not as powerful.

Uses.—Used in febrile conditions about the same as quinine, its chief use is in acute rheumatism, for which it is a very good remedy; as a diaphoretic is used in large doses.

SINAPIS ALBA—WHITE MUSTARD

Derivation.—The dried ripe seeds of Sinapis alba Linne.

Habitat.—Southern Europe and Asia; cultivated in temperate climates.

Description.—Globular, with a circular hilum; shell yellowish, finely pitted, hard; embryo oily, with a curved radicle and two catyledons, one folded over the other; free from starch; inodorous; taste pungent and acrid.

Dose.—Horses, 2 to 4 dr.; cattle, ½ to 1 oz.; sheep and pigs, 1 to 2 dr.; dogs, 10 to 15 gr.

SINAPIS NIGRA—BLACK MUSTARD

Derivation.—The dried ripe seeds of Sinapis Nigra Linne.

Habitat.—Same as White Mustard.

Description.—Globular, with a circular hilum; shell blackish-brown, or grayish-brown, finely pitted, hard; embryo oily, with curved radicle and two cotyledons, one folded over the other; free from starch; inodorous when dry, but when triturated with water, of a pungent, penetrating, irritating odor; taste pungent and acrid.

Constituents.—In the presence of water the latter converts the former into the acrid, volatile, official oil of mustard.

Dose.—Same as white mustard. Commercial form of mustard is a mixture of black and white mustard, and constitutes Sinapis.

PREPARATIONS

OLEUM SINAPIS VOLATILE — VOLATILE OIL OF MUSTARD

Derivation.—A volatile oil obtained from black mustard by maceration with water and subsequent distillation.

Properties. — A colorless or pale yellow, and strongly refractive liquid, having a very pungent and

acrid odor and taste. Freely soluble in alcohol, ether or carbon disulphide, the solution being neutral to litmus paper. Specific gravity 1.013 to 1.020.

Actions.—Is irritant or counter-irritant, rubefacient, vesicant or suppurant, according to the manner in which it is used; it acts much quicker than cantharides, but its action is not so prolonged; the paste made with water and rubbed into the skin of horses, produces its effects within twenty minutes; in two to six hours vesication occurs, pustules may occur where the paste is used very strong or closely repeated, or too much has been used.

The volatile oil of mustard is a very powerful vesicant and acts very quickly.

Uses.—It is used as a counter-irritant in laryngitis, pharyngitis, bronchitis, pneumonia and pleurisy, or wherever a counter-irritant is indicated; applied in the early congested stages it lessens the pain and relieves difficult breathing, besides reflexly limiting the amount of blood in the parts; it thus limits or decreases the inflammatory action; also useful in the exudative stages of these diseases; to promote the absorption of the exudate and thus hasten resolution, or where these diseases remain dormant; also arouse a depressed nervous system and reflexly stimulates the heart; can be used in spinal diseases or in congestion of the kidneys.

It acts best when applied and left on 20 or 30 minutes, then washed off and repeat in an hour or two; also used in acute indigestion, applied to the abdomen; also in colic, enteritis and perionitis; in phlebitis mustard can be used, but a cantharides blister is better. In making a mustard plaster, take the pure powdered mustard and gradually pour in warm water (not hot); can also be made with cold water or vinegar; rub in with moderate friction.

As an emetic for dogs one to two teaspoonfuls in one or two ounces of warm water is very effective.

SODIUM BICARBONATE—BICARBONATE OF SODA

Origin.—Bicarbonate of soda may be obtained by exposing crystals of sodium carbonate to carbonic anhydride, or by the interaction of sodium chloride and ammonium bicarbonate.

Properties.—Bicarbonate of soda is a white, opaque powder, odorless and having a cooling, mildly alkaline taste. It is permanent in dry, but slowly decomposes in moist air. Soluble in twelve parts of water at 15° C. (59° F.); above this temperature the solution gradually loses carbon dioxide, and at boiling heat the salt is entirely converted into normal carbonate, insoluble in alcohol.

Actions.—Antacid, peristaltic stimulant, carminative, alterative and mildly anodyne externally. It also increases fluidity of and secretion of gastric juice.

Uses.—In disorders of the digestive organ administered half hour before meals, to increase the flow of gastric juice, or as an antacid after meals. Young calves when fed on stale skim milk, suffering from dyspepsia, are benefited by one to two drams of bicarbonate of soda, dissolved in each meal of milk. Bicarbonate of soda has become a very popular medicine in the treatment of azoturia in about four ounce doses every four hours. Bicarbonate of soda is used to lessen the irritation of itching skin disorders, as nettle-rash and urticaria, one ounce to a quart of water. Also used as an injection for leucorrhoea. It is an antidote for acid poisoning.

Doses.—Horses, 2 dr. to 4 oz.; cattle, 2 dr. to 2 oz.; sheep and pigs, ½ to 1 dr.; dogs, 10 to 30 gr.

SODII CHLORIDUM—SODIUM CHLORIDE—COMMON OR TABLE SALT

Origin.—Mined in a native state and obtained by evaporation of brine, spring or sea water.

Properties.—It is officially described as in "colorless, transparent, cubical crystals, or a white, crystalline

powder, odorless and heavy, a purely saline taste." Permanent in dry air. Soluble in two and eight-tenths parts of water at 25° C. (77° F.), and in two and a half parts of boiling water; almost insoluble in alcohol.

ACTIONS.—Sodium chloride in small doses is a condiment, restorative, tonic, stomachic, antiferment, alterative, laxative, anthelmintic antiseptic emetic for dogs and used as an injection for pin worms.

Animals deprived of salt do not thrive as it is an essential constituent of food necessary to the composition of HCl in the gastric juice, and of blood plasma, from which it is constantly eliminated in the urine. As an emetic for dogs one to four drams of salt, and one dram of powdered mustard dissolved in four ounces of tepid water. Common salt as an eye-wash is a tonic to the eyes; one dram to a pint of water. Feed animals refined salt, as rocksalt contains irritating properties due to its great impurity. A cooling and stimulating lotion for sprains and bruises may be made by dissolving two ounces of common salt, nitrate of potash and chloride of ammonia in a quart of water.

Use pure cooking salt in *normal salt solution,* which contains six of one per cent (about fifty grains to a pint), or may be made at once by adding a heaping teaspoonful of pure salt into a quart of sterilized water at a temperature of 100° to 110° F. In cases of azoturia give plenty of salt; it acts as a diuretic, makes the horse thirsty and causes him to drink water freely and flushes the kidneys.

DOSE.—Horse, ½ to 1 oz.; cattle, 2 to 3 oz.; sheep, 2 to 4 dr.; pigs, 1 to 2 dr.; dogs, 5 to 20 gr. These doses are stomachic alterative; when used for cattle as a cathartic and vermifuge give 10 to 20 ounces in water, usually combined with magnesium or sodium sulphate.

SODII SULPHAS—SODIUM SULPHATE—GLAUBER'S SALTS

ORIGIN.—Sodium sulphate effloresces on the soil in various parts of Europe. It also exists in solution in many mineral springs in the United States. Sodium

sulphate is also produced artificially in several chemical operations.

Properties.—Sodium sulphate is in large, colorless, transparent, monoclinic prisms, or granular crystals; odorless, and having a bitter, saline taste. It effloresces rapidly in the air, and finally loses all its water of crystalization. Soluble in three parts of water at the temperature of 59° F., insoluble in alcohol, soluble in glycerine.

Actions.—Saline cathartic, chologogue, hepatic stimulant, slightly diuretic and febrifuge. When the effects of a hepatic stimulant is required it should be given in small repeated doses.

Uses.—It is advantageously used as a cathartic in congestion of the liver, in small repeated doses, also useful in dropsical conditions, influenza, especially where the liver is involved; tetanus and febrile diseases, where the bowels are apt to be constipated. Give two to four ounces in a bucket of water. It is successfully used in itching skin diseases in full doses combined with bicarbonate of soda two to four ounces.

Doses.—As a cathartic, well diluted in water at about 59° F.; horses, 16 to 24 ounces; cattle, 1 to 2 pounds; sheep and pigs, 2 to 4 ounces. Where repetition is necessary the dose should be reduced one-eighth of the above. Best results are obtained when administered with capsicum or ginger, as it prevents griping and assists its action.

SODII THIOSULPHAS — SODIUM THIOSULPHATE—SODIUM HYPOSULPHITE

Origin.—Sodium hyposulphite is prepared by dissolving sulphur in boiling aqueous solution of sodium sulphite.

Properties. — Colorless, transparent, monoclinic prisms; odorless and having a cooling, afterwards bitter taste. Permanent in air 91.4° F., but effloresecent in dry air above that temperature; slightly deliquescent in moist air. Soluble in about 0.35 parts of water at 77°

F. At boiling heat the solution is rapidly decomposed; insoluble in alcohol, slightly soluble in turpentine.

Actions.—Sodium hyposulphite is an antiseptic, deodoriser and insecticide. In the presence of acids, without and also within the body, it gives off sulphurous acid, which it therefore resembles. It is thought to destroy ferments and bacteria, and removes offensive smells. Its properties are greatly increased when used along with the tar acids. When standing long in contact with water the sulphite decomposes and gives off hydrogen sulphide.

Uses.—Sodium hyposulphite is recommended in indigestion, fermentation, flatulence and foul smelling feces and in general septic conditions, but have proven as useless as most other medicines in their latter stages. It is used externally in parasitic affections of the skin and mouth in the form of an ointment or solution.

Doses.—Horses and cattle, ½ to 1½ ozs.; sheep and pigs, ½ to 1 dr.; dogs, 5 to 30 gr.

SPIRITUS AETHERIS NITROSI—SPIRIT OF NITROUS ETHER—SWEET SPIRITS OF NITER

An alcoholic solution of ethyl nitrate, yielding when freshly prepared not less than four per cent of ethyl nitrate.

Derivative.—Mix sulphuric acid (40 c. c.) with water (120 c. c.), cool and add alcohol and water each, (85 c. c.) and place in (1000 c. c.) flask surrounded by ice and water. Dissolve sodium nitrate (100 gm.) in water (285 c. c.), filter and allow filtrate to drop slowly into the flask above. Wash ethyl nitrate formed with sodium carbonate solution, to remove acid, and agitate with potassium carbonate, to remove water. All ethyl-nitrate to 22 times its weight of alcohol.

Properties.—A clear, mobile, volatile, inflammable liquid, of a pale-yellowish or faintly greenish-yellow tint, having a fragrant ethereal and pungent odor, free from acidity, and a sharp burning taste. Mixes freely with water and alcohol.

Doses as a Stimulant and Antispasmodic.—Horses, 1 to 3 oz.; cattle, 1 to 4 ozs.; sheep, 2 to 4 dr.; pigs, 1 to 2 dr.; dogs, 15 m. to 1 dr. As a febrifuge and diuretic horses take from 4 dr. to 1 oz.; 4 dr. is sufficient as a rule every two, three or four hours, usually combined with other medicines for all of its purposes, in fever and colic cases.

Actions.—Spirit of nitrous ether conjoins the action of the alcohol and ethyl nitrite of which it consists. It is hence a general stimulant and a relaxer and paralyzer of non-striped muscle. It relieves acute fever and the difficult breathing of bronchitis and asthma. It is antispasmodic, diaphoretic and diuretic. Large doses are narcotic.

Uses.—Consisting of strong spirit and a saline ether, when swallowed it stimulates the stomach and intesties; is hence stomachic, carminative and antispasmodic, and is prescribed to animals in indigestion, tympanites, colic and convalescence from debilitating disorders. But its properties as a diffusible nitrite, relaxing spasm of involuntary muscles, also come into operation. It dilates arterioles, thus decreases arterial tension, and hence is of special value in the acute stages of fever, whether depending upon specific conditions or local inflammation. It relaxes the muscular fibers of the bronchial tubes, and thus relieves the spasmodic contraction and difficulty of breathing, which characterise catarrh, bronchitis and some forms of asthma. It is specially indicated when the heart action is weak and there is difficulty of breathing—conditions frequently concurring in influenza of horses. During excretion, notably by the skin and kidneys, its twofold constitution is further useful as the alcohol stimulates secretion, while the ethyl nitrate dilates the lumen of contracted vessels, and thus diaphoresis and diuresis are promoted in fevers, local inflammations, rheumatism and other disorders. As it is readily decomposed, even by water, it should be diluted or mixed with other medicines or water only

immediately before it is administered. It is usually given in cold water, beer or linseed tea.

SPIRITUS GLYCERYLIS NITRATIS—SPIRIT OF GLYCERYL TRINITRATE—SPIRIT OF GLONOIN

An alcoholic solution containing one per cent, by weight, of nitroglycerine. It is probably decomposed in the formation of potassium and sodium nitrite.

Derivation.—Nitroglycerine is prepared by dropping pure glycerine upon a mixture of sulphuric and nitric acids, kept cool by ice, and purified by washing with water. The official one per cent solution is not explosive unless it becomes concentrated by evaporation to an extent exceeding ten per cent.

Properties.—A clear, colorless liquid, possessing the odor and taste of alcohol. Caution should be exercised in tasting it, since even a small quantity is liable to produce violent headache.

Dose.—Horses and cattle, ½ to 1 dr.; sheep and pigs, 5 to 20 m.; dogs, 1 to 2 m. It is administered hypodermically, intravenously, intracheally or by the mouth according to the emergency of the case. For hypodermic injections one-half drachm is usually sufficient and should be diluted with one or two parts of water. It may be repeated in 15 or 20 minutes if necessary, then every hour or two if required. Care should be exercised not to repeat oftener than is necessary, or to give too large a dose as violent headache is produced by the drug in animals as well as in man.

Actions.—Are the same as amyl nitrite, but more prolonged.

Spirit of nitroglycerine is the most prompt and powerful of all heart stimulants, showing its effects usually within three to five minutes.

Uses.—It is best used in the official solution, but for dogs may be carried in tablets or pills containing 1/100 of a grain of glonoin. The spirit, however is more dependable. It is a good plan in cases of cardiac

weakness to brace up the heart with Spirit of Glonoin, then maintain the effect with Tincture Strophanthus.

SULPHUR SUBLIMATUM — SUBLIMED SULPHUR—FLOWERS OF SULPHUR

DERIVATION.—Obtained from native sulphur by sublimation.

PROPERTIES.—A fine, yellow powder, having a slightly characteristic odor and a faintly acid taste. Insoluble in water; slightly soluble in absolute alcohol; more readily soluble in benzine, benzol, oil of turpentine and many other oils; also in ether, chloroform and in boiling aqueous solutions of alkaline hydrates.

DOSE.—Horses and cattle, 2 to 4 oz.; sheep and pigs, 1 to 2 oz.; dogs, 1 to 4 dr.

PREPARATIONS

SULPHUR LOTUM—WASHED SULPHUR

DERIVATION.—Obtained from sublimed sulphur, which is treated with diluted ammonia water to wash out sulphurous and sulphuric and ether impurities.

PROPERTIES.—A fine, yellow powder, without odor or taste. Solubility same as sublimed sulphur.

DOSE.—Same as sublimed sulphur.

SULPHUR PRECIPITATUM—PRECIPITATED SULPHUR

DERIVATION.—Obtained from a solution of sublimed sulphur, 100; in boiling calcium hydrate, 50; by precipitation with hydrochloric acid.

PROPERTIES.—A fine, amorphous powder, of a pale yellow color, without odor or taste. Solubility same as sublimed sulphur.

DOSE.—Same as sublimed sulphur.

UNGUENTUM SULPHURIS—SULPHUR OINTMENT

Composed of washed sulphur, 150; benzoinated lard, 850.

ACTIONS.—Sulphur applied to skin or mucous surfaces is a feeble, mechanical stimulant, and hence re-

lieves chronic passive congestion. It destroys parasitic infestion of the skin. Administered internally it is a laxative and alterative. It destroys fungi on vines and kills similar parasites affecting plants and animals. How much of this toxic effect depends on the sulphur acting as sulphur, and how much on the alkaline sulphides, sulphuretted hydrogen and sulphurous acid into which it is gradually converted, has not been determined. Sulphur when swallowed is slowly acted upon by the alkaline secretions of the intestines, and small quantities are converted into sulphides, which stimulate the intestinal mucous membrane. A further change liberates sulphuretted hydrogen, which imparts its disagreeable smell to the breath, secretions of the skin and bowels. The greater part of the sulphur swallowed is removed unchanged by the bowels, but a portion is excreted in the urine as sulphates. Over-doses given to horses and other animals cause colic, purging, prostration and sometime fatal gastro-enteritis.

Uses.—Sulphur is given to the several domestic animals as a laxative where more powerful purgatives might irritate—as in pregnancy, convalescence from acute diseases in young animals, and in piles.

Its alterative and stimulant effects on the skin have led to its use in rheumatism, eczema and cutaneous diseases. Some veterinarians affirm that it benefits dry congested conditions of the respiratory membrane by stimulating its epithelial cells and increasing movements of the cilia. It has no special vermicide action. Sulphur dusted on the skin slightly stimulates, but when dissolved by admixture with an alkali or oil, and smartly rubbed in, it more actively stimulates the cells of the rete Malpighi and thus hastens desquamation; while it also increases contractility of the muscular textures, and hence overcomes passive cutaneous hyperaemia. It thus promotes a healthier action in chronic eczema and psoriases, and in such cases sulphur dressings are used with benefit combined or alternated with iodine or tar acids, and are aided by the internal use of sulphur and

arsenic. Infriction of sulphur ointment is stated to relieve the pain of rheumatic muscles and joints. Sulphurous gas from burning sulphur is used for husk or hoose of sheep and calves; this is a disease in which worms affect the bronchial tubes, due to strongylus micrurus in calves and strongylus filaria in sheep. The patients are placed in a loose box and sulphur is burned about six feet away from them, so that air may dilute the fumes before being inhaled by the animals; let them inhale the fumes for ten or twenty minutes or longer, unless irritation is too great.

TARAXACUM—DANDELION ROOT

The fresh and dried roots of Taraxacum officinale, collected in the autumn.

Habitat.—United States and Europe.

Properties.—The root is about six to twelve inches long, half an inch to an inch thick, is dark brown externally and white within. It breaks with a short fracture; from the fractured surface a milky juice exudes, which is inodorous, but has a bitter taste.

Constituents.—Taraxacin, a bitter, soluble, crystalline substance; inulin, taraxacerin, resin causing milky juice, asparagin of no medical value.

Dose.—Horses and cattle, 1 to 2 oz.; sheep and pigs, 2 to 4 dr.; dogs, 1 to 2 dr.

PREPARATIONS

EXTRACTUM TARAXACI—EXTRACT OF TARAXACUM

Made by percolation of powdered taraxacum with alcohol and water, and evaporation.

Dose.—Horses and cattle, 1 to 4 dr.; sheep and pigs, 30 gr. to 1 dr.; dogs, 5 to 20 gr.

FLUIDEXTRACTUM TARAXACI—FLUIDEXTRACT OF TARAXACUM

Made by maceration and percolation with dilute alcohol, and evaporation.

Dose.—Horses and cattle, 1 to 2 oz.; sheep and pigs, 2 to 4 dr.; dogs, 1 to 2 dr.

Action and Uses.—Taraxacum is a simple stomachic and bitter and may be employed in place of gentian or calumba. It has been generally taught that taraxacum is a hepatic stimulant and increases the secretion of bile. This has been proven valueless. The extract is often used as a base in preparing masses.

ZINGIBER—GINGER

The scraped and dried rhizome of Zingiber officiale.

Habitat.—East and West Indies and India; cultivated in tropical climates.

Properties.—Ginger owes its taste to a pungent resin, its aroma to a volatile oil, and its medicinal and flavoring properties to both constituents, which are chiefly found in the delicate felted layer lying between the starchy, mealy parenchyma and the brown, horny, external covering.

Dose.—Horses, 2 dr. to 1 oz.; cattle, 1 to 4 oz.; sheep and pigs, 1 to 2 dr.; dogs, 5 to 15 gr.

PREPARATIONS

FLUIDEXTRACTUM ZINGIBERIS—FLUIDEXTRACT OF GINGER

Made by maceration and percolation with alcohol, and evaporated so that 1 c. c. equals 1 gm. of the crude drug.

Dose.—Same as for ginger.

TINCTURE ZINGIBERIS—TINCTURE OF GINGER

Made by percolation of ginger with alcohol and water.

Dose.—Horses, ½ to 2 oz.; cattle, 1 to 4 oz.; sheep, 2 dr. to 1 oz.; pigs, 1 to 2 dr.; dogs, 15 to 30 m.

OLEORESINA ZINGIBERIS—OLEORESIN OF GINGER

Does.—Horses, 30 m. to 1½ dr.; dogs, 1 to 5 m.

Action and Uses.—Ginger is an aromatic stimu-

lant, and is used as a stomachic and carminative for all animals, notably for cattle and sheep. Ginger is administered internally, promotes gastric secretion, digestion and appetite. It is prescribed in atonic dyspepsia, often along with antacids and laxatives. Conjoined with purgatives it diminishes their tendency to nauseate and gripe, and also somewhat hastens their effects. The powder or fluidextract should be added to magnesium and sodium sulphate when given in full purgative doses to cattle or sheep.

ZINCI PHENOLSULPHONAS—ZINC SULPHOCARBOLATE

Derivation.—Zinc sulphocarbolate may be obtained by heating a mixture of phenol and sulphuric acid and saturating the product with zinc oxide.

Properties.—Colorless, transparent, rhombic prisms or tabular crystals; odorless and having an astringent, metallic taste. Soluble in water and alcohol.

Dose.—Horses and cattle, 2 to 4 dr.; foals and calves,, 5 to 10 gr.; sheep and pigs, 20 to 40 gr.; dogs, 4 to 6 gr.

Action and Uses.—Zinz sulphocarbolate has been employed as an antiseptic astringent stimulant to indolent or foul wounds, and in subacute inflammations of the mucous membrane. The solution used may be a little stronger than those of zinc sulphate employed for similar purposes. It is also used as an intestinal antiseptic.

ZINCI SULPHAS—ZINC SULPHATE

Derivation.—Prepared by dissolving zinc in sulphuric acid. Iron and tin exist as impurities and are removed by chlorine solution and zinc carbonate.

Properties.—A colorless, transparent, rhombic crystal, without odor and having an astringent, metallic taste. Efflorescent in dry air; soluble in water and glycerine; insoluble in alcohol.

Dose.—Horses and cattle, 1 to 2 dr.; sheep and pigs,

10 to 20 gr.; dogs, 2 to 3 gr. As an emetic for dogs, 10 to 15 gr.

Actions.—Irritant, emetic, astringent, antiseptic and nerve tonic. Externally it is used as stimulant, astringent and antiseptic; in dogs it is a prompt and efficient emetic, causes no depression and acts both on the stomach nerve centers; poisonous or long continued large doses in the horse dry up the secretions, cause nausea, colic and efforts to vomit; dogs cannot be poisoned by it as it causes vomiting.

Uses.—As a tonic it is inferior to iron; chief use is externally as an astringent; it is used in white lotion combined with lead acetate; sometimes used internally with opium to stop excessive sweating in frequent small doses. Used as a safe and prompt emetic for dogs and pigs.

Externally in solution as an astringent and stimulant for wounds, ulcers, simple ophthalmia and irritable conditions of the mucous membrane of the uterus or vagina and urethra, vesicular and pustulant skin eruptions. Proper strength, one ounce to one quart of water in ophthalmia, one-half to one drachm to one pint of water.

ZINCI CARBONAS PRAECIPITATUS — PRECIPITATED ZINC CARBONATE

Derivation.—Solutions of nearly equal weight of sodium carbonate and zinc sulphate are boiled together; dry precipitate. This salt is in reality a mixture of zinc carbonate and oxide, in varying proportions, with water of crystallization.

Properties.—An impalpable white powder, of somewhat variable chemical composition, without odor or taste; insoluble in water or alcohol.

ZINCI OXIDUM—ZINC OXIDE

Derivation.—Zinc oxide, may be prepared by exposing zinc carbonate to a dull red heat, or from metallic zinc by combustion.

PROPERTIES.—An amorphous, white powder without odor or taste. Insoluble in water or alcohol.

DOSE.—Horses and cattle, 1 to 2 dr.; sheep and pigs, 10 to 20 gr.; dogs, 5 to 10 gr. Not much used internally.

PREPARATIONS

UNGUENTUM ZINCI OXIDE—OINTMENT OF ZINC OXIDE

Composed of zinc oxide, 200 parts; benzoinated lard, 800 parts.

ACTIONS AND USES.—Used chiefly as a dusting powder for wounds and excoriated surfaces; used alone or conjoined with boric acid, subnitrate of bismuth, calomel or in the form of the zinc oxide ointment is desiccant, mildly astringent and protective; it is sometimes used in chorea, epilepsy and other nervous diseases; to check excessive sweating and in diarrhoea. Used extensively in wounds and diseases of the cow's udder.

ZINCI ACETAS—ZINC ACETATE

DERIVATION.—Dissolve zinc oxide in diluted acetic acid and boil. Evaporate and crystallize.

PROPERTIES.—Soft, white, six-sided monoclinic plates, of a pearly lustre, having a faintly acedious odor and an astringent metallic taste. Soluble in water and in alcohol.

DOSE.—Same as zinc sulphate.

ACTION AND USES.—The same as zinc sulphate; it is the acetate of zinc which is the soluble agent in white lotion, caused by the acetate of lead and sulphate of zinc changing their composition.

ZINCI CHLORIDUM—ZINC CHLORIDE

DERIVATION.—Dissolve zinc in hydrochloric acid by boiling. The solution contains the zinc chloride with chlorides of iron and lead as impurities. These are precipitated by adding first nitric acid then zinc carbonate. Filter and finally evaporate.

PROPERTIES.—A white, granular powder, or porcelain-like masses, irregular or moulded into pencils; odorless; of such intensely caustic properties as to make tasting dangerous unless the salt be dissolved in much water, when it has an astringent, metallic taste; very deliquescent; soluble in water and alcohol.

LIQUOR ZINCI CHLORIDE — SOLUTION OF ZINC CHLORIDE

DERIVATION.—Made from zinc chloride and water. It should contain about 50 per cent, by weight, of the salt. Zinc chloride is used externally only.

PROPERTIES.—A clear, colorless, liquid, odorless, having a very astringent, metallic taste.

ACTION AND USES.—Is caustic and escharotic, used full strength or in a strong solution; penetrates very deeply and causes deep sloughing; an irritant and corrosive poison; mild medical solutions are antiseptic and astringent; is also disinfectant and deodorizer. Can be used as a caustic when indicated; used with caution, for granulations in chronic ulcers and foot-rot in sheep; to slough out all kinds of fistula, usually mixed with one or two parts of flour made into a paste with water, two ounces in a pint of water is injected as a caustic into fistulous tracts; two or three per cent solution or two to four drachms to the pint of water is used for ordinary astringent purposes and as a parasiticide.

VALUABLE DRUGS AND THEIR DOSES FOR DOMESTIC ANIMALS

In the list of doses, oz. stands for ounce, pt. for pint, lb. for pound, gr. for grain, dr. for dram, dp. for drop.

Name of Drug	Cattle	Sheep	Horses	Hogs	Dogs
Alcohol	4 oz.	1-2 oz.	2-4 oz.	1-2 oz.	1-4 dr.
Alum	3-4 dr.	40 gr.	2-4 dr.	40 gr.	15 gr.
Ammonia Aromatic	2 oz.	1-2 dr.	1-2 oz.	1-2 dr.	20-60 dp.
Aniseed	1-5 oz.	1-2 dr.	1 oz.	1 dr.	15 gr.
Arnica Tincture	1 oz.	2 dr.	.5-1 oz.	1 dr.	7-20 dp.
Asafetida Tincture	3 oz.	.5 oz.	2 oz.	2 dr.	1 dr.
Boracic Acid	3 dr.	20 gr.	1-3 dr.	15 gr.	8 gr.
Brandy	4 oz.	1-2 oz.	2-4 oz.	1-2 oz.	1-2 dr.
Calomel	1-2 dr.	5-20 gr.	1 dr.	5-20 gr.	1 gr.
Camphor Spirit	1 oz.	2 dr.	2-4 dr.	15 dp.	10 dp.
Carbolic Acid	1-2 dr.	10-20 dp.	.5-2 dr.	5-15 dp.	3-8 dp.
Castor Oil	1 pt.	2-4 oz.	1 pt.	2-4 oz.	1-2 dr.
Chalk	2 oz.	1-2 dr.	.5-2 oz.	1 dr.	.5-1 dr.
Codliver Oil	3-8 oz.	3-8 dr.	2-6 oz.	2-6 dr.	1-3 dr.
Copperas	2 dr.	20 gr.	1 dr.	10 gr.	4 gr.
Copper Sulphate	2-4 dr.	20-30 gr.	2-4 dr.	20-30 gr.	1-2 gr.
Digitalis	10-30 gr.	5-15 gr.	10-50 gr.	3-10 gr.	2 gr.
Epsom Salts	1 lb.	1-4 oz.	.5-1 lb.	1 oz.	1-4 dr.
Fowler's Solution	5 dr.	5-20 dp.	2-4 dr.	5-20 dp.	1-5 dp.
Gentian	5-8 dr.	1-2 dr.	4-8 dr.	1-2 dr.	40 gr.
Ginger	5-8 dr.	1-2 dr.	2-8 dr.	15-60 gr.	5-20 gr.
Glauber Salts	1-1.5 lb.	1-4 dr.	.5-1 lb.	1 oz.	1-4 dr.
Iodide of Potash	1-2 dr.	10-25 gr.	.5-2 dr.	5-20 gr.	2-8 gr.
Iron Sulphate	2 dr.	25 gr.	1-2 dr.	25 gr.	4 gr.
Jamaica Ginger	2 oz.	.5 oz.	1 oz.	.5-1 dr.	¼-½ dr.
Laudanum	2-5 oz.	1-4 dr.	1-4 oz.	1-2 dr.	20 dp.
Lead Acetate	1 dr.	25 gr.	1 dr.	20 gr.	1-2 gr.
Lime Water	4-6 oz.	2 oz.	4-6 oz.	2 oz.	1-8 dr.
Linseed Oil	1-2 pt.	6-12 oz.	.5-1 pt.	5-10 oz.	1 oz.
Mustard	1 oz.	1-2 dr.	.5-1 oz.	1-2 dr.	20 gr.
Nitre	3-8 oz.	1 dr.	1-2 oz.	1 dr.	5-20 gr.
Nux Vomica	2 dr.	30-40 gr.	1-2 dr.	10-20 gr.	1-2 gr.
Olive Oil	1-2 pt.	3-8 dr.	1-2 pt.	2-6 dr.	2-4 oz.
Pepper	2-4 dr.	15-25 gr.	1-3 dr.	10-20 gr.	4-10 gr.
Potassium Bromide	2 oz.	2-4 dr.	1-2 oz.	2-4 dr.	5-50 gr.
Quinine	1-2 dr.	5-10 gr.	50-60 gr.	5-10 gr.	1-2 gr.
Rhubarb	1-2 oz.	1 dr.	1-2 oz.	1 dr.	5-10 gr.
Saltpeter	1-3 dr.	.5-1 dr.	2-4 dr.	.5-1 dr.	2-10 gr.
Soda	2 oz.	2-4 dr.	1-1.5 oz.	1-3 dr.	20-50 gr.
Sulphur	3-4 oz.	1-2 oz.	2-4 oz.	1-2 oz.	1-4 dr.
Turpentine	2 oz.	1-4 dr.	1-2 oz.	1 dr.	20-50 dp.

INDEX

Abbreviations in Prescription Writing 24
Absolute Alcohol 36
Acetate of Lead.....131
Acetate of Morphine.....123
Acetate of Potassium.....133
Acetate of Zinc.....162
Acid Arcenous 58
Acid Benzoicum 67
Acid, Boric 25
Acid Boricum 25
Acid, Carbolic 26
Acid, Carbolic..... 26
Acid, Salicylic 28
Acidum Arsenosum 58
Acidum Carbolicum 26
Acidum Carbolicum Crudum 26
Acidum Salicylicum 28
Aconite, Fluidextract..... 31
Aconite, Tincture 31
Aconite 29
Aconitum 29
Aconitina 31
Aconitine 31
Actions of Iron..... 93
Adeps Benzoinatus 66
Administration of Medicines. 20
Aether 33
Aloe Barbadensis 41
Aloe Socotrina 41
Aloes Barbadoes 41
Alcohol 35
Alcohol Absolutum 36
Alkaloidal Salts of Chichona 84
Aloin 42
Aloinum 42
Alum 44
Alum, Dried 44
Alumen 44
Alumen Exsiccatum 44
Alumini Hydroxidum..... 44
Alumini Sulphas 45
Aluminum Hydroxide 44
Aluminum Sulphate 45
Ammonia Aromatic Spirit.. 51
Ammonia Liniment 52
Ammonia Muriate 54
Ammonia Spiritus 50
Ammonia Stronger Water... 50
Ammonia Water 50
Ammonii Benzoas..... 67
Ammonii Carbonas 52
Ammonii Chloridium..... 54
Ammonium Acetate Solution 52
Ammonium Benzoate 67
Ammonium Carbonate..... 52
Amyl Nitrate 46
Anesthesia 79
Anise 47
Anise Oil 47
Anisum 47
Antimonii et Potassii Tartars 48
Antipyrin 49
Antipyrina 49
Anylis Nitris 46
Antimony and Potassium Tartrate 48
Apomorphine Hydrochloride.127
Apomorphine Hydrochloridum 127
Aqua Ammoniae 50
Aqua Ammoniae Fortior.... 50
Aqua Camphorae 71
Aqua Chloroformi 77
Arcenous Acid 58
Argenti Nitras Fusus..... 55
Argenti Nitras 54
Argente Nitras Mitigatus... 55
Arnica 56
Arnica Root, Extract..... 56
Arnica Root, Fluidextract... 56
Arnicae 56
Aromatic Fluidextract of Cascara Sagrada.....146
Aromatic Spirit Ammonia... 51
Aromatic Tincture of Rhubarb 147
Arseni Trioxidum 58
Arsenic 57
Arsenic Troxide..... 58
Arsenic, White 58
Arsenum 57
Art of Prescribing.....22-23
Aspidium 61
Atropinae Sulphas 64
Barbadoes Aloes 41
Belladonna Extract 63
Belladonna Leaves 62
Belladonna Liniment 64
Belladonna Ointment 63
Belladonna Radix 63
Belladonna Root 63

Belladonna Tincture 63
Belladonnae Folia 62
Benzoate of Ammonia 67
Benzoate of Soda 67
Benzoic Acid 67
Benzoin 66
Benzoin Tincture..... 67
Benzoinated Lard 66
Benzoinum 66
Bicarbonate of Potassium..136
Bicarbonate of Soda.....150
Biniodide of Mercury.....102
Bi-Chloride of Mercury..... 99
Bitartrate of Potassium.....141
Bitter Wood.....143
Black Mustard.....148
Blister Beetles 74
Blue Stone..... .88
Blue Vitriol..... 88
Boracic Acid 25
Boric Acid 25
Brandy 37
Bromide of Potassium.....134
Bromide of Sodium.....134
Calamus 68
Calamus Fluidextract 68
Calcium Oxide 69
California Buckthorn.....145
Calomel 101
Calumba 69
Calumba Fluidextract..... 70
Calumba Tincture 70
Calx 69
Camphor 71
Camphor Cerate 72
Camphor Liniment 72
Camphor Water 71
Camphora 71
Camphora Monobromata.... 72
Camphorated Oil 72
Camphorated Tincture of Opium 121
Cantharis 74
Cantharrides 74
Cantharides Tincture..... 74
Capsicum 75
Capsicum Fluidextract..... 76
Capsicum Oleoresin 76
Capsicum Tincture..... 76
Carbolic Acid..... 26
Carbolic Acid, Crude..... 26
Carbonate of Ammonia..... 52
Carbonate of Potassium....135
Carron Oil 69
Cascara Sagrada.....145
Castor Oil.....115
Catechu 97
Caustic Potash.....136
Cayenne Pepper 75
Cerate of Camphor 72
Ceratum Camphorae 72
Chalk Mixture..... 87
Chalk, Prepared 86
Chichona 83
Chichona Alkaloids..... 84
Ether 81
Chittem Bark.....145
Chlorate of Potassium.....140
Chloride of Iron..... 93
Chloride of Mercury, Mild..101
Chloride of Sodium.....150
Chloride of Zinc.....162
Chloroform 77
Chloroform Compared with Chloroform Emulsum..... 78
Chloroform Liniment 77
Chloroform Spirits..... 78
Chloroform Water..... 77
Chloroformum 77
Citrate of Potassium.....133
Cocaine Hydrochloride 85
Cocainae Hydrochloridum... 85
Cod Liver Oil.....114
Codeina 123
Codeine 123
Comparison of Ether with Chloroform 81
Compound Chalk Powder.... 87
Compound Powder of Jalap.145
Compound Powder Rhubarb.146
Compound Spirit of Ether... 34
Compound Spirit of Juniper. 37
Compound Tincture of Benzoin 67
Compound Tincture of Gentian 99
Compound Tincture of Gambir 97
Copper Sulphate..... 88
Copperas 91
Corrosive Mercuric Chloride 99
Corrosive Sublimate..... 99
Cosmoline 128
Cotton Seed Oil.....115
Cream of Tartar.....141
Creta Praeparata 86
Cretae Mistura 87
Cretae Pulvis Compositus... 87
Croton Oil.....118
Crude Carbolic Acid..... 26
Cupri Sulphas 88
Diacetylmorphine 123
Dandelion Root.....158
Digitalein 89
Digitalin 89
Digitalis 88

Digitalis Infusion..... 90
Digitalis Extract 89
Digitalis Fluidextract..... 90
Digitalis Tincture..... 90
Digitonin 89
Digitoxin 89
Deodorized Opium.....122
Donovan's Solution 59
Dover's Liquid Powder.....121
Dover's Powder.....121
Doses for Young Animals.21-22
Dose Table of Valuable Drugs 164
Dried Ferrus Sulphate..... 91
Emulsion of Chloroform.... 78
Epsom Salts.....109
Ether 33
Ether Compared with Chloroform 81
Ether, Pure..... 33
Extract of Arnica Root..... 56
Extract of Belladonna Leaves 63
Extract of Digitalis 89
Extract of Gentian..... 98
Extract of Nux Vomica.....111
Extract of Opium.....121
Extract of Quassia.....143
Extract of Taraxacum.....158
Extractum Arnicae Raicis... 56
Extractum Belladonnae Foliorum 63
Extractum Digitalis 89
Extractum Gentianae..... 98
Extractum Nucis Vomicae..111
Extractum Opii.....121
Extractum Quassiae.....143
Extractum Tarxaci.....158
Ferri Carbonas Saccharatus. 92
Ferri Chloridum..... 92
Ferri Sulphas..... 91
Ferri Sulphas Exsiccatus.... 91
Ferric Chloride..... 92
Ferrous Sulphate..... 91
Ferrum Reductum..... 91
Flaxseed 107
Fluidextract of Aconite..... 31
Fluidextract of Arnica Root. 56
Fluidextract of Belladonna Root 63
Fluidextract Calamus 68
Fluidextract of Calumba..... 70
Fluidextract of Capsicum.... 76
Fluidextract of Digitalis..... 90
Fluidextract of Gentian..... 98
Fluidextract of Ginger.....159
Fluidextract of Hydrastis...104
Fluidextract Nux Vomica...111
Fluidextract of Quassia.....143
Fluidextract of Rhamnus Purshiana 145
Fluidextract of Rhubarb....146
Fluidextract of Taraxacum..158
Fluidextractum Aconiti..... 31
Fluidextractum Arnicae Radicis 56
Fluidextractum Belladonnae Radicis 63
Fluidextractum Calumbae... 70
Fluidextractum Calami..... 68
Fluidextractum Capsici..... 76
Fluidextractum Digitalis.... 90
Fluidextractum of Gentianae. 98
Fluidextractum Hydrastis...104
Fluidextractum Nucis Vomicae 111
Fluidextractum Quassiae....143
Fluidextractum Rhamni Purshiana 146
Fluidextractum Rhamni Purshiana Aromaticum.....145
Fluidextractum Rhei.....146
Fluidextractum Taraxaci.....158
Fluidetxractum Zingiberis...159
Fowler's Solution 58
Foxglove 88
Gambir 97
Gambir Tincture Compound. 97
Gamboge 70
Gambogia 70
General Actions of Medicines 5-19
Gentian 98
Gentian Extract..... 98
Gentian Fluidextract..... 98
Gentian Tincture Compound. 99
Gentiana 98
Ginger 159
Ginger Fluidextract.....159
Ginger Oleoresin.....159
Ginger Tincture.....159
Glauber's Salts.....151
Glycerite of Boroglycerin... 25
Glycerite Hydrastis.....104
Glyceritum Boroglycerin.... 25
Glyceritum Hydrastis.....104
Golden Zeal 103
Goulard's Extract.....132
Green Vitriol..... 91
Gregory's Powder.....146
Gum Camphor 71
Heroin 123
Hoffman's Anodyne 34
Hydrate of Turpin.....117
Hydrastine Hydrochloride..104
Hydrastis 103

Hydrastis Fluidextract.....104
Hydrastis Glycerite.....104
Hydrastis Tincture.....104
Hydrargyri Oxidum Flavum.103
Hydrargyri Chloridum Corrosivum 99
Hydrargyri Chloridum Nite.101
Hydrargyri Iodidum Rubrum 102
Hydrastinae Hydrochloridum 104
Hydroxide of Potassium....136
Hyposulphite of Sodium....152
Hydroxide of Aluminum.... 44
Infusion of Digitalis..... 90
Infusum Digitalis..... 90
Iodide of Mercury (Red)....102
Iodide of Potassium.....137
Iodine 105
Iodum 105
Ipecac and Opium.....121
Iron Actions 93
Iron Chloride..... 92
Iron Reduced..... 91
Jalap 144
Jalap Compound Powder....145
Jalapa 144
Jalapa Resina.....144
Jalap Resin 144
Lard Benzoinated 66
Laudanum 121
Lead Acetate.....131
Lead Oxide.....131
Lime 69
Lime Liniment 69
Liniment, Ammonia 52
Liniment Belladonna..... 64
Liniment Chloroform 77
Liniment Soap..... 72
Liniment of Turpentine.....117
Linimentum Ammoniae 52
Linimentum Belladonnae ... 64
Linimentum Calcis 69
Linimentum Camphorae..... 72
Linimentum Saponis 72
Linimentum Terbinthinae....117
Linseed 107
Linseed Oil.....107
Linum 107
Liquid Dover's Powder.....121
Liquid Petrolatum.....128
Liquor Ammonii Acetatis... 52
Liquor Arseni et Hydrargyri Iodidi 59
Liquor Ferri Chloridi..... 93
Liquor Ferri Subsulphatis... 93
Liquor Plumbi Subacetatis..132
Liquor Potassii Arsentis.... 58
Liquor Potassii Hydroxidi..137
Liquor Zinci Chloride.....163
Lithii Benzoas 67
Lithium Benzoate 67
Lunar Caustic 55
Male Fern 61
Magnesii Sulphas.....109
Magnesium Sulphate.....109
Medicines, General Actions.5-19
Medicines, Administration... 20
Mercury Bi-Chloride..... 99
Mercury Oxide (Yellow)....103
Methods of Administering Medicines 20
Mild Mercurous Chloride....101
Mitigated Silver Nitrate.... 55
Monkshood 29
Monobromated Camphor.... 72
Monsels' Solution 93
Morphina 122
Morphine 122
Morphinae Acetas.....123
Morphinae Hydrochoridum.122
Morphinae Sulphas.....123
Morphine Acetate.....123
Morphine Hydrochloride....122
Morphine Sulphate.....123
Moulded Silver Nitrate..... 55
Muriate of Ammonia..... 54
Mustard, Black.....148
Mustard Oil.....148
Mustard, White.....148
Naphthalene 110
Naphthalenum 110
Nitrate of Potassium.....139
Nitrate of Silver..... 54
Niter 139
Nitrite Amyl 46
Nux Vomica 110
Nux Vomica Extract.....111
Nux Vomica Fluidextract...111
Nux Vomica Tincture.....112
Oil of Anise 47
Oil Camphorated 72
Oil Carron 69
Oil of Castor.....115
Oil of Cod Liver.....114
Oil of Cotton Seed.....115
Oil of Croton.. 118
Oil of Linseed.....107
Oil of Mustard.....148
Oil, Olive.....114
Oil, Sweet.....114
Oil of Turpentine, Rectified.117
Oil of Tar.....130
Ointment of Tar.....130
Ointment of Zinc Oxide....162
Oleum Anisi 47
Oleoresin Aspidium 62

Oleoresin Capsicum 76
Oleoresin Male Fern..... 62
Oleoresina Aspidi 62
Oleoresina Zingiberis.....159
Oleoresina Capsici 76
Olemum Gossipii Seminis...115
Oleum Lini 107
Oleum Morrhuae.....114
Oleum Olivae.....114
Oleum Pisis Liquidae.....130
Oleum Ricini.....115
Oleum Sinapis Volatile.....148
Oleum Terebinthinae.....116
Oleum Terebinthinae Rectificatum 117
Olive Oil.....114
Oil of Turpentine.....116
Olrum Tiglii.....118
Opii Pulvis.....120
Opium 120
Opium Deodoratum.....122
Opium Extract.....121
Opium and Ipecac.....121
Opium, Powdered.....120
Opium Tincture.....121
Opium Tincture, Camphorated 121
Opium and Wine.....122
Oxide of Lead.....131
Oxide of Zinc.....161
Paregoric 121
Pepper, Cayenne 75
Pepper, Red 75
Permangante of Potash.....142
Petrolatum 128
Petrolatum Album.....129
Petrolatum Liquidum.....128
Petrolatum White.....129
Phenol 26
Phenyl Salicylate 29
Phenylis Salicylas 29
Pix Liquida.....130
Plumbi Acetas.....131
Plumbi Oxidum.....131
Potassii Acetas.....133
Potassii Citras.....133
Potassii Bicarbonas.....136
Potassii Bitartras.....141
Potassii Bromidum.....134
Potassii Carbonas.....135
Potassii Chloras.....140
Potassii Hydroxium.....136
Potassii Iodidum.....137
Potassii Nitras.....139
Potassii Permanganas.....142
Potassium Acetate.....133
Potassium Bicarbonate.....136
Potassium Bitartrate.....141
Potassium Bromide.....134
Potassium Carbonate.....135
Potassium Chlorate.....140
Potassium Citrate.....133
Potassium Hydroxide.....136
Potassium Hydroxide Solution 137
Potassium Iodide.....137
Potassium Nitrate.....139
Potassium Permangante.....142
Precipitated Sulphur.....156
Precipitated Zinc Carbonate.161
Prepared Chalk 86
Prescribing, the Art of.....22-23
Prescription Writing, Abbreviations 24
Prescription Writing Tables. 21
Pulvis Ipecacuanhae et Opii.121
Quaker Button.....110
Quassia 143
Quassia Extract.....143
Quassia Fluidextract.....143
Quassia Tincture.....144
Quininae et ureae Hydrochloridum 85
Quininae Sulphas 84
Quinine Sulphate 84
Quinine and Urea Hydrochloride 85
Rectified Oil of Turpentine.117
Red Iodide of Mercury.....102
Red Wine 38
Reduced Iron..... 91
Red Pepper 75
Resin of Jalap.....144
Resina Jalapa.....144
Rhamnus Purshiana.....145
Rheum 146
Rhubarb 146
Rhubarb Compound Powder.146
Rhubarb Fluidextract.....146
Rum 38
Saccharated Ferrous Carbonate 92
Sal Ammoniac 54
Salicin 147
Salicinum 147
Salicylas Sodium 28
Salicylic Acid 28
Salol 29
Saltpeter 139
Salts (Epsom) 109
Salts of Tartar.....135
Silver Nitrate 54
Sinapis Alba.....148
Sinapis Nigra.....148
Soap Liniment 72
Socotrine Aloes 41

Sodii Bromidum.....134
Sodii Chloridum.....150
Sodii Salicylas 28
Sodii Sulphas.....151
Sodii Thiosulphas.....152
Sodium, Salicylas 28
Sodium Benzoate 67
Sodium Bicarbonate.....150
Sodium Bromide.....134
Sodium Chloride.....150
Sodium Sulphate.....151
Sodium Thiosulphate.....152
Sodoa Benzoas 67
Solution of Ammonia Acetate 52
Solution of Ferri Chloride... 93
Solution of Ferric Subsulphate 93
Solution of Lead Subacetate.132
Solution of Potassium Arsenite 58
Solution of Potassium Hydroxide 137
Solution of Zinc Chloride...163
Spanish Fly 74
Spirit Ammonia 50
Spirit of Camphor 72
Spirit of Chloroform..... 78
Spirit of Ether..... 34
Spirit of Glonoin.....155
Spirit of Glyceryl Trinitrate.155
Spirit of Nitrous Ether.....153
Spirits Vini Gallici..... 37
Spiritus Aetheris..... 34
Spirotus Aetheris Compositus 34
Spiritus Aetheris Nitrosi....153
Spiritus Ammoniae 50
Spiritus Ammoniae Aromaticus 51
Spiritus Camphorae 72
Spiritus Chloroform 78
Spiritus Frumenti 37
Spiritus Glycerylis Nitratis..155
Spiritus Juniperi Compositus 37
Stronger Ammonia Water... 50
Strychnina 112
Strychnine 112
Strychnine Sulphate.....112
Strychninae Sulphas.....112
Sulphate of Aluminum 45
Sugar of Lead.....131
Sulphate of Atrophine..... 64
Sulphate of Copper..... 88
Sulphate of Copper..... 91
Sulphate of Iron, Dried..... 91
Sulphate of Magnesium.....109
Sulphate of Morphine.....123
Sulphate of Quinine 84
Sulphate of Strychnine.....112
Sulphate of Zinc.....160
Sulphate of Sodium.....151
Sulphur Flowers..... 156
Sulphur Lotum.....156
Sulphur Ointment.....156
Sulphur Precipitatum.....156
Sulphur Sublimatum.....156
Sulphur Sublimed.....156
Sulphur Washed.....156
Sweet Flag 68
Sweet Oil.....114
Sweet Spirits of Niter.....153
Syrupus Ferri Iodidi..... 92
Syrup of Ferrous Iodide.... 92
Tables used in Prescription Writing 21
Tables Regulating the Doses for Young Animals.....21-22
Tables of Weights and Measures 21
Tar 130
Tar Oil.....130
Tar Ointment.....130
Taraxacum 158
Taraxacum Extract.....158
Taraxacum Fluidextract.....158
Tartar Emetic 48
Terebene 117
Terebenum 117
Terpin Hydrate.....117
Terpini Hydras.....117
Tinctura Aconiti 31
Tinctura Aloes et Myrrhae.. 42
Tinctura Arnicae 56
Tinctura Belladonnae Foliorum 63
Tinctura Benzoini 67
Tinctura Benzoini Composita 67
Tinctura Cantharidis..... 74
Tinctura Capsici 76
Tinctura Digitalis..... 90
Tinctura Calumbae 70
Tinctura Gambir Composita. 97
Tinctura Gentianae Composita 99
Tinctura Hydrastis.....104
Tinctura Ipecacuanhae et Opii 121
Tinctura Nucis Vomicae.....112
Tinctura Opii.....121
Tinctura Opii Camphorata..121
Tincture Aconite 31
Tincture of Aloes and Myrrh 42
Tincture of Arnica 56
Tincture of Belladonna Leaves 63
Tincture Benzoin 67
Tincture of Calumba..... 70

Tincture of Capsicum..... 76
Tincture Cantharides..... 74
Tincture of Digitalis..... 90
Tincture of Ferric Chloride.. 93
Tincture Hydrastis.....104
Tincture of Ipecac and
Opium 121
Tincture of Nux Vomica....112
Tincture of Opium.....121
Tincture Quassiae.....144
Tincture Rhei Aromatica....147
Tincture Zingiberis.....159
Turpentine 116
Turpentine Liniment.....117
Tincturus Ferri Chloridi.... 93
Unguentum Belladonnae 63
Unguentum Pisis Liquidae..130
Unguentum Sulphuris.....156
Unguentum Zinci Oxide.....162
Vaseline 128
Vinum Album 38
Vinum Opii.....122
Vinum Rubrum 38
Vitriol, Blue..... 88
Vitriol, Green..... 91
Wand Measures Tables..... 21
Whisky 37
White Mustard.....148
White Wine 38
Wine of Opium.....122
Wine, Red 38
Wine, White 38
Yellow Mercusic Oxide.....103
Zinc Acetate.....162
Zinc Chloride.....162
Zinc Chloride Solution.....163
Zinc Oxide.....161
Zinc Sulphate.....160
Zinc Sulphocarbolate.....160
Zinci Acetas.....162
Zinci Carbonas Praecipitatus.161
Zinci Chloridum.....162
Zinci Oxidum.....161
Zinci Phenolsulphonas.....160
Zinci Sulphas.....160
Zingiber 159

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